DOCUMENT RESUME

ED 254 625 CE 040 416

TITLE Collaboration: Vocational Education and the Private Sector. 1984 Yearbook of the American Vocational Association.

INSTITUTION American Vocational Association, Inc., Arlington, Va.
REPORT NO ISBN-0-89514-045-4
PUB DATE 83
NOTE 243p.
AVAILABLE FROM American Vocational Association, 2020 N. 14th Street, Arlington, VA 22201 (Paperback: ISBN-0-89514-045-4, Order No. P1984--$12.00; Hardback: ISBN 0-89514-044-6, Order No. 01984--$20.00).
PUB TYPE Collected Works - General (020) -- Books (010) -- Reports - Descriptive (141)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Advisory Committees; Apprenticeships; Business; Case Studies; Community Resources; *Cooperative Planning; *Cooperative Programs; Coordination; *Delivery Systems; Economic Development; Educational Cooperation; Educational Needs; Educational Practices; Educational Strategies; Educational Trends; Futures (of Society); Industry; *Program Development; *School Business Relationship; School Role; Student Organizations; Unions; *Vocational Education
IDENTIFIERS *Private Sector

ABSTRACT

This yearbook includes 24 papers dealing with collaboration between the vocational education and private sectors. Presented first are the following papers on the foundation for collaboration: "The Changing Nature of Work and Workers" (Joseph F. Coates), "Jobs with a Future" (Marvin J. Cetron), "The Mission of Vocational Education and Trends in Training Delivery" (Donald F. Averill), "A Rationale for Collaboration: The View from Industry" (Richard E. Clinton), "Requisites for Collaboration: The View from the Financial Community" (James M. Howell and Linda D. Frankel), and "A Rationale for Collaboration: The View from Labor" (Jack Reihl). The following papers address issues in collaboration: "Is Vocational Education Ready for Collaboration?" (Jerome Moss, Jr.), "Why Business Finds It Hard to Work with Schools" (Gayle Jasso), "Educational Institutions Must Welcome Collaboration" (Don C. Garrison), "Governance: A Help or Hindrance?" (William Payne and B. Lamont Carter), and "How Employer-Employee Contracts Affect Collaboration: The View from Education" (Harold McAninch and Joan Bevelacqua). The next two sections contain the following descriptions and case histories of collaborative programs: "The Economic Development Role of Vocational Education" (Paul V. Braden), "Collaboration: Vocational Education and the Private Sector" (John C. Graves), "Issues in Collaboration between Organized Labor and Vocational Education" (Kenneth R. Edwards and Theresa M. Carroll), "Collaboration in Apprentice Programs: Experience with In-School Apprenticeships" (Robert W. Glover), "Revitalizing an Old Medium: Using Advisory Committees" (Moody Oswald), "California's Regional Occupational Programs" (David L. Smith and Patricia B. Langlin), "Using the Community as a Resource" (Cecil L. Groves), VICA and the United States Skill Olympics" (Larry W. Johnson), "Community Work-Education Councils" (Gerald G. Gold), "The Role of Private Industry Councils in Training the Economically Disadvantaged" (William H. Kolberg), and "The Boston Compact" (William Spring). The final two papers--"Adapting Technology for Instructional Delivery" (Joseph I. Lipson) and "A Futuristic Scenario: Collaboration in the Year 2000" (Paul E. Barton)--deal with collaboration in the future. (MN)

COLLABORATION:

Vocational Education and the Private Sector

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1984 Yearbook of the American Vocational Association

Collaboration: Vocational Education and The Private Sector

In a timely and thought-provoking review of collaboration between vocational education and the private sector today, this book reaffirms the time-honored practice of linking what is taught in vocational and technical classrooms to the requirements of the workplace. Employers and educators share the goal of training individuals to be competent, productive members of the work force, able to contribute to the economy by entering and advancing in the occupation of their choice. This book is a practical account of what can be done through private sector/education collaboration, why it should be done, and how to do it.

The book begins with an eye-opening account of the workplace reasons why industry and education must work together. The nature of work is changing fast and so are the expectations of workers and employers. The jobs with a future call for new knowledge and new skills. Without mutual support and regular communication between employers and vocational/technical educators, the task of adapting to technological change would be overwhelming.

The 25 chapters in this volume provide a careful analysis of the problems that may block and the solutions that can foster joint efforts. The book goes beyond the rationale for private sector/vocational education collaboration to guide the reader to an understanding of how to bring it about. From one end of the nation to another, individuals, groups, corporations, organizations, and institutions are creating new patterns of collaboration. The book explores this rich variety of successful responses to a common goal.

Finally, in the concluding section, *Collaboration: Vocational Education and the Private Sector* reminds us that even as we write and speak and do, change goes on. Staying alert to what the future will bring is a way of making sure that employers large and small and educators at every level stay on the track in their collaborative efforts.

Hardback O1984 $20.00
Paperback P1984 $12.00

COLLABORATION: VOCATIONAL EDUCATION AND THE PRIVATE SECTOR

1984 Yearbook
of the
American Vocational Association

American Vocational Association, Inc.
Arlington, Virginia

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ISBN: 0-89514-044-6 (cloth)
ISBN: 0-89514-045-4 (paper)

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Introduction

The word *collaboration* describes a major characteristic of vocational education as it has been known and interpreted by millions of Americans during the past eight decades. It is therefore fitting that the 1984 yearbook of the American Vocational Association be titled *Collaboration: Vocational Education and the Private Sector*.

This is the 13th yearbook published by the association since the first was widely distributed in 1971. On reflection, the books have responded to their times. The first grew out of the hopes, fears, issues and problems of vocational education during the turbulent 1960s. It provided the general reader and professional educators with a forceful, readable account of vocational education at a time when society was demanding a broadened range of educational opportunities.

The 1984 yearbook continues the tradition of presenting an important discussion about an important issue in a way that can reach a diverse reading public. This book is a thorough and sincere effort to present contemporary ideas, facts, and beliefs about a single characteristic of vocational education that is drawing enormous attention today: namely, collaboration.

Hasty reviewers often interpret collaboration narrowly as a working relationship with advisory groups. This limited view of the subject defeats the purpose of collaboration. The 1984 Yearbook Advisory Committee therefore took a broad and forward approach to the subject, taking into account the philosophical, economic, political, and other factors that affect joint efforts of the employment community and education. Led by Chairman James Hannemann, committee members Donald F. Averill, Lillian B. Bates, and B. Lamont Carter planned this book carefully and well.

The 1984 yearbook is divided into five sections. Section I establishes the rationale for collaboration. Joseph F. Coates, president of J.F. Coates, Inc., writes of the changing nature of work and workers, treating the technological and demographic changes that call for new styles of training and new relationships with business and industry. Marvin J. Cetron, president of Forecasting International, Ltd., authors a projection of the specific occupations that will lose or gain jobs in the coming decade and beyond. In a related series of articles, Donald F. Averill, vice chancellor for educational planning and vocational education for the Coast Community Colleges in California; Richard E. Clinton, director of human resource plan-

ning for Tenneco, Inc.; co-authors James M. Howell, senior vice president and chief economist for the Bank of Boston, and Linda D. Frankel, executive director of the Council for Northeast Economic Action; and Jack B. Reihl, secretary-treasurer of the Wisconsin State AFL-CIO, present their views of the mission of vocational education and the goals of collaboration.

Section II is devoted to issues in collaboration, again from a variety of perspectives. Jerome Moss, Jr., of the University of Minnesota, considers whether vocational education is ready for collaboration. Gayle Jasso, vice president of community affairs for Security Pacific National Bank, writes frankly about why business finds it hard to work with schools. Don C. Garrison, president of Tri-County Technical College in South Carolina, offers an inside view of the effects of collaboration upon an institution. Co-authors B. Lamont Carter, vice president for strategy and planning at Boeing Engineering at Oak Ridge, and William Payne, assistant to the executive director of the Tennessee Higher Education Commission, discuss the effects of various systems of governance. Harold D. McAninch, president of the College of DuPage, Illinois, and Joan Bevelacqua, director of the Business and Professional Institute there, jointly write about how employer-employee contracts affect collaboration.

The third section of the yearbook presents a number of successful types of collaborative efforts designed to meet the needs of the private sector. Economist Paul V. Braden, of the U.S. Department of Commerce, writes about the role of vocational education in economic development. John C. Graves, manager of organization development and training at Rockwell International's Rocky Flats Plant in Colorado, describes the experience of his company in a collaborative program. Theresa M. Carroll, writing with Kenneth R. Edwards, director of skill improvement training for the International Brotherhood of Electrical Workers, provides a detailed account of the goals and scope of the union's collaborative efforts. Robert W. Glover, director of the Center for the Study of Human Resources at the University of Texas at Austin, reports on new directions in apprenticeship training.

Case histories of collaborative efforts in vocational education have not been neglected in this book. Section IV carries revealing accounts of a broad range of successful activities. The writers are Moody Oswald, state director of vocational education in South Carolina; David L. Smith, chief executive officer, and Patricia B. Langlin, director of program development, for the North Orange County Regional Occupational Program in California; Cecil L. Groves, president of Austin Community College, Texas; Larry W. Johnson, chief executive officer of the Vocational Industrial Clubs of America, Inc., Gerard G. Gold, senior program officer at the National Institute for Work and Learning; William H. Kolberg, presi-

dent of the National Alliance of Business; and William Spring, president of the Boston Private InJustry Council.

Finally, Section V looks to the future. Joseph I. Lipson, director of projects at WICAT, Inc., explains how the use of advanced educational technology and instructional design can improve the quality of education. Paul E. Barton, president of the National Institute for Work and Learning, in a flight of speculative thought, makes us wonder how the next chapter in the continuing story of collaboration between vocational education and the private sector will be written.

This yearbook is a valuable contribution to the professional vocational educator and to the private sector citizen as well. The American Vocational Association presents this book with a sense of excitement about its potential for improving vocational education through a more enlightened approach to planning, implementation, and evaluation of collaborative efforts in vocational education.

Joe D. Mills
President
American Vocational Association

SECTION I

The Foundation for Collaboration Between Industry and Education

When the history of 20th century education is written, one of the true success stories will be the capacity of vocational education to have changed as society changed. Since its inception, vocational education has always risen to the challenges put forth by society. One of the reasons for this is that the vocational education profession acts from a sound philosophical position that fosters curricular change to reflect society's own changes.

The current interest in collaboration between vocational education and the private sector has been greatly stimulated by the changes already taking place in our economy and society, with more to come. Work is changing, and so are workers. In the first chapter of this section, Joseph F. Coates examines the changing nature of work and the accompanying needs for training at all levels of the work force.

Collaborative activities are influenced by the types of jobs that will become extinct and types of jobs that will emerge. Marvin J. Cetron, using precise yardsticks to measure the accuracy of predictions, lists specific occupations that are either disappearing or growing. This information forms the background for Donald F. Averill's article on the mission of vocational education for today and tomorrow.

American industry is moving from labor-intensive to technology-intensive manufacturing. What impact will this change have upon the success of collaborative efforts? Richard E. Clinton explores the effects of this trend as he addresses the rationale for collaboration from the viewpoint of an industrialist, presenting the problems, the deficiencies, and the opportunities facing collaborative efforts between industry and vocational education.

The effects of successful vocational education on the economic well-being of a community are discussed by James M. Howell and Linda D.

Frankel. The authors describe what the financial community finds unfamiliar and disquieting about vocational education and the reason for optimism as all partners join to improve the training of our nation's work force.

Plant closings, major layoffs, worker dislocations, and shifting skill requirements are a major concern to the labor community. Jack Reihl addresses the future and the demands of collaboration from the viewpoint of labor, exploring the need for a national industrial policy to support the collaborative effort.

Collaboration between the private sector and vocational education cannot be considered a superficial academic exercise. It must be viewed as essential for the survival of our nation's education program. And it must be viewed as a major challenge for all of us. This section of the 1984 yearbook prepares us for that challenge.

James Hannemann

The Changing Nature of Work and Workers

Joseph F. Coates

Vocational education is a derivative enterprise—derivative of our expectations about work and the value of formal preparation for the world of work. Unfortunately for those with strong psychological, experiential, and career commitments to the expectations of the past, the world is now changing. Change is so pervasive and rapid that virtually every aspect of the relationship between work and workers is now open to reassessment.

A dozen or so areas of change have drastic if not radical implications for vocational education. Harsh realism, however, intrudes on our optimistic hope for effective institutional response. The realities of institutional inertia tell us that there is likely to be a long lag in the response of educational institutions to long-range trends. Why? Because often it seems to be more risky to address the future than it is to invest in the past. Tending to a future pregnant with change disrupts the comfortable patterns of administrators. Nevertheless, the forces are in motion and changes are under way. Potential choices for those in vocational education are to lead or to follow, to pull or to be pushed, to bend or to break.

The big trend areas driving the future of work are demography; telecommunications, computers and other technological and scientific developments; structural changes in the national and global economy; worker attitudes; and value shifts throughout our society.

DEMOGRAPHIC TRENDS

Effects of Aging Population

The most striking universally recognized demographic trends in the United States are the long-term decline in fertility, a principal consequence of which is smaller families, and a steady aging of the population. Today, the average age of the population is 30 and may rise by the year 2030 to 41 years. One long-term implication of aging is a reversal of the tendency toward early retirement and a movement toward more extended worklife. Considering the wide variation in the effects of aging on human competence, skill, health, and stamina, the latter end of the working life will be a time when many people move toward part-time work and a phasing down from established midcareer responsibilities. For many others, there will

be a move toward alternative work styles and a shift to new careers in the second half of the working life.

The Baby Boom Matures

Demography also tells us that in the present circumstances there is a relative glut of young people at the entry level and a relative shortage of people at midcareer and in the middle management ages. Gradually, however, that baby boom will pass through the population like a pig through a python. We will move through a period of surplus labor in the middle management, midcareer stage and a relative dearth of those at the entry level.

One of the implications in these changing patterns is that what now seems so traditional—entering the work force and gradually assuming greater and greater responsibilities with increasing income—is not likely to be a sustainable pattern over the next several decades. We will, therefore, have to look for new ways of allocating work and rewarding workers. For this reason alone, but reinforced by others mentioned below, we can expect drastic changes in the pattern of compensation and rewards offered by all kinds of institutions and offered to virtually every kind of occupation.

Effects of Immigration

Immigration will continue to be an important labor force factor. Today, roughly 25 percent of net population growth in the United States is attributable to immigration. Unlike immigration patterns in the past, these immigrants are not coming from the traditional European stock. In the first three decades of this century, 81 percent of immigrants were from Europe, 11 percent from Canada, and only 8 percent from Asia or Latin America. Today the pattern is reversed—81 percent of immigrants are Asian or Latin American; only 13 percent are European and 3 percent Canadian.

Immigrants will be relatively young and relatively more fecund, producing a relatively larger percentage of the entry-level work force. They also are relatively less prosperous compared to the base population. These immigrants also tend to settle in metropolitan areas.

All of these factors create opportunities for vocational education. Those opportunities will be accompanied by increasing problems of acculturation of the immigrants into the work force.

Regionally, the effects of immigration will be profound. The section of the country from Padre Island on the Texas coast to Los Angeles in California will, by the end of the century, almost certainly be a bilingual, bicultural, politically potent Hispanic dominion.

Women's Impact

Demographically, the most exciting change in relation to work and work-life is the mass entry of women into the work force. The are now coming in with the full expectation of staying to retirement, with perhaps a hiatus of weeks or months to have a child or two. Increasingly, women will become a fully integrated factor in the work force. Whereas today women at all occupational levels earn only about 60 percent as much as men, we can expect parity in income will be achieved eventually

A derivative effect of women's large-scale movement into the work force will be a gradual change in the nature of the work environment, work patterns and work styles. Pressures for these changes will come from the fact that women are biologically, physically, and psychologically different from men. Women are less confrontational and adversarial. They are more cooperative. Pressures for cooperation at the work place will come from women, tending to undercut authoritarian, hierarchical working arrangements.

CHANGES IN THE ECONOMY

A most significant long-term change in the American economy over the past 50 years has been the movement from a localized to a regional and finally today to an integrated national economy. No Fortune 500 company now operates merely as a local or regional organization. Factories and assembly plants dispersed across the country characterize the manufacturing company; multiple franchises and service outlets characterize the mercantile, consumer, and service sector of the economy. The chain store is everywhere; it has been a major factor in homogenizing the population.

But just as we complete the conversion of the economy to a national scale, we find an even more interesting phenomenon occurring—the integration of national economies into a truly global economy. Increasingly, organizations of the manufacturing sector—automobiles, machines, hard goods, and so on—have become international in their marketing, in their manufacturing, and in their servicing. Atari is about to manufacture overseas. Even American service and chain operations directed at consumers are going international. Fast food, in the form of McDonald's, is in Paris. Insurance and banking now take the globe as their unit of planning and organization.

Increasingly, jobs will be allocated on that new international pattern, not on the old national pattern. We will see an accelerated tendency in the U.S. economy of moving to high technology and to those things which are derivative of the most advanced developments in science and technology. As manufacturing operations become more routinized, and hence, as

labor costs become a more determining factor in their operations, we can expect jobs to migrate out of the country. The jobs will migrate as the digital watch, electronics, shipbuilding, and other industries have migrated from the United States.

Shifting the Industrial Base

If we are fortunate, if we plan well, if we maintain a healthy polity and economy, those old industries—the smokestack industries—will be replaced by new industries dependent upon electronics, genetics, biological developments, composite materials, new chemicals, and so on. Today, about 22 percent of the work force is in manufacturing. One can expect some reasonable decline in that percentage as traditional industries coalesce, consolidate, and internationalize. However, one might very well expect an increase in employment in new forms of industry that we do not even now think of as manufacturing. Critical to this new industrial base for the United States, therefore, is a need to shift away from the concept of the old factory to plan for the new factory, the new chemical plant, the new biological plant, the new high-tech operation. We can also expect further development in the information and service industries as they become an increasingly important part of our place in the global economy.

The Telematics Revolution

If the late Victorian era was the age of steam, and the middle of the present century the age of oil and electricity, we could very well call the emerging era the age of the electron and photon. Over half the work force is now in the business of handling, generating, or processing information. The technologies for that major segment of the work force are the technologies of telecommunications and the computer. We choose to use a neologism coined for the president of France—telematics—to describe that total collection of information-related technologies.

The steady sharp decrease in the cost of telematics devices is accompanied by their rapid invasion of home, office, and industrial site. One only has to look at any national magazine or trade publication to see that the most promising advertisements are those for word processors, automated office equipment, satellite dishes, advanced telephones, microcomputers, and even robots. White collar, blue collar, and pink collar jobs will be enhanced, diminished, reshaped, and created by these technologies.

The Inevitability of Robotization

The movement toward robotization is almost certainly unstoppable, even if it were desirable to stop it. But robots will not be used in the future merely for manufacturing of devices in factories. Ultimately they will

move to the outdoors where robotized bricklaying, robotized carpentry, robotized construction, robotized tunneling, robotized working of all kinds of maintenance construction and operations will transform not only construction but ocean mining, forestry, agriculture, and virtually any other activity which calls for human labor.

Inevitably, technological unemployment will occur. As inevitably, new or higher paying jobs, albeit for a smaller percentage of the traditional work force, will be created out of these new technologies. Accompanying the development of robots as well as the rest of this technology will be a blurring of traditional occupational categories, higher standards for performance, and more interesting jobs in tending to, repairing, manufacturing, and installing robots, and new organizational arrangements at the workplace to permit a range of human interactions with the new families of automated machines. In some factories, few or no people will work; in others, people will work in parallel, in support, and in conjunction with robots. Of course, robots are now being introduced to increase productivity at the workplace, and it is that productivity which, in turn, should keep the economy stimulated, create better products and higher income, and, in general, raise the standard of living of the population, as have other technological developments in the past.

THE WORK FORCE AND WORKER ATTITUDES

The demographic, economic, and technological changes we are witnessing are producing potentially substantial changes in the nature of the work force and in the attitudes of workers. In fact, every area of worklife is being altered—where work is done, when it is done, how it is done, and how relationships among workers and between workers and their superiors are shaped.

Flexibility in the Workplace

It is rather clear that we are moving to a situation in which flexibility in the workplace will be an increasingly prominent aspect of nearly everyone's work and family life. In fact, many employers already have established the practice of flextime in which workers may choose how to allocate their working hours—starting earlier and staying later in the day or working longer hours per day, for fewer days per week (four ten-hour days, for example).

Flextime is rapidly being augmented by flexplace. Many white collar and other information workers find that there is no real reason why they must work at a central place, at a factory, at a downtown highrise. We see increasingly a movement toward white collar work being done at suburban sites and professional and semi-professional work being done at home.

There is even an increasing tendency for strictly routine pink collar work to be done at home. The flexibility of the information worker is now rivaling that of the traditional service craft worker.

In many places, such as New York City, it is now economically attractive and almost routine to export white collar typing and data entry functions. That export, however, is not merely to the suburbs but it is now routine to export information tasks overseas to places like Jamaica. One can send tapes or raw material on paper, manuscripts and so on, to be processed into final form in Jamaica, where the work force is literate and low paid. Work material is generally shuttled back and forth by airplane.

Flexible Careers

Further down the road, but joining flextime and flexplace, are flexible careers. The middle-aged work and life crisis is rapidly moving away from the stigma of "crisis." Changes in occupation are increasingly becoming expected and routine. In my view, the dumbest question that one can now ask an eight- or ten-year-old is, "What do you want to be when you grow up?" The question rather should be, "What are all the things you plan to be when you grow up?" A new problem for the vocational educator as well as for other educators is to prepare us for multiple careers and to legitimate multiple careers over a 45 - 50-year working life.

As an important adjunct to flextime, flexplace, and flexcareers, there is an increasing tendency toward job sharing, in which husbands and wives, or even unrelated people, assume responsibilities for a single standard job. Shared jobs are particularly attractive to workers who, for one reason or another, are interested only in part-time work. It is striking to note the high percentage of part-time workers who are voluntarily part-time, that is, not forced by economic hardship into part-time employment.

Democratization of the Workplace

Flexible time and flexible place will influence job selection, promote job sharing, and permit working on a more discretionary basis around the clock, around the week, at individuals' discretion. These technologies hold great potential for further democratization of the workplace because more people will be able to more freely participate in traditional white collar work, whether that is low-level data entry jobs or high-level analytical, scientific, and professional work.

For the long term, one impact we may anticipate from the automation of the office is more widespread solicited or unsolicited participation in the organization's deliberations and judgments. Centralized data banks with internal electronic mail will permit and ultimately encourage broader worker interaction with management on the affairs of the organization.

The computer, when tied to interactive two-way cable, modern telephony, and space satellites, will make computer-assisted analysis and processing of information as commonplace in our society as the present use of pen, pencil, mail, and telephone. We may expect an explosive growth in computer assisted modeling and design and computer-aided data processing, not just as tools for work, but as avocations, as hobbies, and as tools for the testing and challenging of every public and private activity by any individual or organization who chooses to challenge. Public interest groups, labor unions, and virtually every other organization will adopt this new technology as a tool in sharpening judgment and more incisively presenting positions.

The clue to successfully anticipating the implications of telematics technology on work and workers and on the work place is to recognize that every aspect of our lives that involves the production, generation, storage, handling, and use of information will be affected by these technologies in ways that will increase interconnections, reduce costs, encourage participation, and widen choices.

Expansion in Personal Independence

Now and in the immediate future, the dual income family will have, on the average, 160 percent of the current male income. This implies a tremendous expansion in personal independence. Dual income will make it increasingly practical and popular to salt away enough money for either family member of the working partnership to take three months or six months or a year off to look for a better job, to pursue a hobby, or for some discretionary activity. More importantly, that independence will permit the worker to force change at the workplace and to thwart, disagree with, and act vigorously against organizational and managerial nonsense in the work life.

Working women will create an unprecedented degree of independence at the work place for themselves and for their husbands. The implication for vocational education is rather clear—to educate both male and female workers for the presence of women in the work force. More important than this is the problem of educating male and female workers for a lifestyle and a family style of parity and fairness between spouses. Consider the social class origins of those traditional participants in vocational education who hold a highly traditional view of manhood as being the ability to support a family. This is a concept on the road to obsolescence and to being a socially destructive male pathology. A great burden for worker education is not merely in skills and crafts but in home and family living in a world of multiple careers and economic parity.

New Autonomy

The new worker is increasingly sharing the general population's craving for diversity, autonomy, greater involvement, and greater freedom of choice at the worksite. That tendency is being reinforced and stimulated by other factors in the economy. Most large manufacturing organizations are now aggressively seeking mechanisms for increasing productivity. Very large corporations such as General Motors, Ford, and Westinghouse are moving toward quality circles and other worker participation techniques at the worksite.

Autonomy and participation are not merely management-driven benefits passed on to the worker and, hence, subject to being drawn back from the worker by management whim. Autonomy is a demand intrinsic to an increasingly educated, informed, and independent worker. As a counterpoint to a widely touted vulgar myth, there is virtually no evidence to sustain any proposition that hard work is going out of style. What is going out of style is a tolerance for drudgery, for demeaning and dehumanizing work. Workers of all ages are increasingly making it clear that they want to be interested in, informed about, and involved in a useful way with their work.

INFLUENCE OF VALUES

Politically, a number of factors will influence work and workers. Increasingly, accountability at the work place is showing up in occupational health and safety regulations, continuing and expanding concerns about environmental quality, and concerns about amenities. This move toward a higher-quality work environment seems by all measures to be a permanent part of America's political life.

Questions for Vocational Education

More important from a political and values point of view is the fundamental question affecting vocational education in relation to work. That question is whether vocational education will be primarily driven by welfare considerations or whether it will be driven by considerations of work and worklife. In recent decades, all too frequently vocational education has been a mere adjunct of welfare rather than a primary positive force framing a vision of the worker, the worklife, and the worker's family life in the future.

Vocational education, as with formal education in general, can become a primary tool for democracy and a primary opportunity for widening our vision. Unfortunately, this discussion has barely begun in the vocational education community.

Labor's Opportunity

Of the primary drivers that should be promoting a new role for vocational education, labor unions themselves are so in flux that they are not ready to align themselves with vocational education in shaping images of our future. As it stands today, unions are in the awkward position of being a declining enterprise in the face of an expanding work force. That decline, to an extent, results from the fact that the hundred-year-old agenda of Samuel Gompers and organized labor has been met. The labor movement is in the conceptual crisis of not knowing where to go or how to get there. It lacks an image of work, an image of worklife, and an image of the future of the family. But when that all gets sorted out, the present decline of the vigor and vitality of organized labor may be replaced by an unprecedented revival. We see some signs of this opportunity in the growth of white collar professional unions. Today may be a pallid image of what unions may yet hold for the future as an organizing principle of worklife in our society.

One of the elements that should enter into shaping new images of the future of work and working is the blurring of the practical distinctions which have so consistently informed organizational thinking over the last few decades. The blurring distinction between blue, white, and pink collar work has already been mentioned, but there is the blurring between professional and subprofessional work, the blurring between male and female work roles, and, of course, the new factor already alluded to—the intrusion of the steel collar worker (the robot) into the workplace.

Broad Changes in Values

Other values shifts are under way in American society. On the one hand we are moving toward a society more averse to risks, at least more averse to those risks arbitrarily imposed on us—the risks of transportation, the risks of construction, the risks on the highway, the risks of chemicals. On the other hand, at a personal level, we are increasingly willing to accept recreational risks such as skiing and hang gliding and those personal risks that come with freedom of choice, autonomy, and control, as witnessed by the present explosive growth in entrepreneurship and small businesses.

Other values are expanding in our society, values of cooperation, new images of the role of stress and stress management, and new desires to deal more positively with things that in the past have been treated negatively—labor/management conflict, for example. Having virtually completed building an incredibly parasitic and overblown labor force for organizational combat—our hundreds of thousands of lawyers—we seem, nevertheless, to be moving as a society toward values which will override and eventually overcome these pathological tendencies to convert every issue into a legalistic, adversarial interest. We seem to be moving back to

more traditional relationships in worklife. Even in the large corporations, cooperation is coming back into style.

Within the corporate framework, other values shifts affecting work can be seen. Both the anecdotal and the limited survey research tell us that the traditional tacit contract in which the young worker engages upon employment with a large corporation is now in default. The traditional view is that if you join a large corporation when young, keep your nose clean, and work hard, you will assume increasing responsibilities and mature into a happy, prosperous organizational life; this has soured. Increasingly we see that that tacit contract is a bad deal bereft of significant rewards for most of those who have gone by the rules. Large organizations will have to take this reality into account and develop a new reward structure that deals with the new worker's needs. This pressure will come about, not merely because it makes managerial good sense, but because the workers will demand it.

For reasons already noted, workers will be increasingly independent, and the changing work patterns will create more demands first for minor change and then later for more radical changes. We already see minor changes in corporations in terms of the delivery of benefit packages. We see the development of the so-called cafeteria style benefits in which workers are given broader and broader choice as to what benefits they may choose. The entrepreneurial interests in American society are increasingly shown in the growth of the underground economy, and in the proliferation of the small businesses, part-time employment, and independent quasi-vocational, avocational activities. All of these have strong implications for formal and informal, institutionalized and noninstitutionalized vocational education.

SUMMARY

We must begin to recognize that the old ways, the old attitudes, the old paradigms of work are obsolete. Vocational education must begin to create positive new images of work and worklife, if it is to be anything more than an incidental adjunct of formal schooling and a psychological repository for those who see no better choices. The opportunity ahead for vocational education is to move to center stage and become the organizing institutional framework shaping the lives of tens of millions of both young and mature citizens. Vocational education must break out of the schoolhouse walls and recognize, as other education has recognized for many years, that education can be individualized, as well as mass, and that it must be lifelong. Knowledge must be delivered to the worker, where the worker wants it, and at the worker's convenience. It must be delivered in formats that are appropriate and compatible with the diverse style of American life.

Bringing education to the worker, in collaboration with employers and labor unions, will be an important new opportunity for vocational education. The data is clear that workers prefer to be educated and trained at the workplace—not to go to some other place. Telecommunications, computers, video packs, video disks, portopacks—all of these technologies make it possible to deliver vocational education to the worker at the worksite. This creates an institutional question and problem as well as opportunity and challenge for organizations traditionally committed to working in a fixed facility and having the students come to them. The movement to dealing with workers in mid-career, mature workers, and older workers ties into the question of rescheduling, reorienting, and reframing traditional vocational education.

Perhaps the most significant opportunity for vocational education is to reach out to the whole range of potential workers, from those with no degrees to those with Ph.D.s plus, to instill in workers the sense that physical labor, the traditional domain of vocational work, is legitimate, fulfilling, and a desirable activity, part of a full, rich, informed, and educated life. The new opportunity for vocational education is to educate the total worker, not merely the craftsman, the operator, and the assembler.

Vocational education must be a tool for flexibility and choice, for life enhancement. The opportunities are there to grasp, but they can only be grasped when one has images of the future.

Jobs with a Future

Marvin J. Cetron

Forecasters, unlike futurists, use precise yardsticks to measure the accuracy of a prediction. These yardsticks include technical and economic feasibility and social and political acceptability. If any of these do not apply to a projected change, it will not rate a positive forecast.

For example, a futurist might determine solar energy is the way of the future because it is clean, nonpolluting, and in an inexhaustible supply. However, in this forecast example, even though solar energy is technically feasible and acceptable socially and politically, it will not become economically feasible until oil prices rise to $54 per barrel. Therefore, solar energy will not be the way of the future.

When applying these tests and measures to occupations, one thing is certain about tomorrow's job markets: major dramatic shifts will occur in employment patterns. These changes are going to affect how we work and how we are educated and trained for jobs.

Major shifts in the job market will not necessarily mean major changes in the numbers of people employed. What it does mean is that many of the old jobs will disappear, and not just because of robots and computers. Manufacturing will consume only 11 percent of the jobs in the year 2000, down from 28 percent in 1980. Jobs related to agriculture will drop from 4 percent to 3 percent. The turn of the century will find the remaining 86 percent in the service sector, up from 68 percent in 1980. Of the service sector jobs, half will relate to information collection, management, and dissemination.

Unemployment will be an ongoing problem. If the current recession were to end tomorrow, probably 1.2 million of the more than 11 million unemployed today would never be able to return to their old jobs in the automobile, steel, textile, rubber, or railroad industries. This is called structural unemployment.

IMPACT OF TECHNOLOGY

Foreign competition in low-wage countries will eliminate about one-sixth of the 1.2 million jobs. Another one-sixth will disappear because of the nationalization of many major industries in other countries which results

in "dumping" of products on our market and undercutting our prices. "Computamation" (robotics, numerically controlled equipment, CAD/CAM [computer-aided design and computer-aided manufacturing], and flexible manufacturing) will assist in the demise of the remaining two-thirds of the jobs eliminated.

As this technological transition takes place, productivity will increase. For example, the use of robotics or CAD/CAM in the automotive industry can replace up to six workers if operating around the clock. Quality control increases four-fold, and scrap is reduced from 15 percent to less than 1 percent.

Japan already uses some of these new jobs and technology. It had no choice. Currently, it imports 96 percent of its energy. By the year 2000, that will rise to 98 percent. Eighty-seven percent of all of Japan's resources come from the outside. These statistics contributed to the decision to go robotic. But the essence of Japan's problem is that between 1985 and 1990 20 percent of the entire workforce will retire at 80 percent of their base pay for the rest of their lives. They were forced to go robotic to remain competitive. The United States, too, will be filling many of today's blue collar jobs with robots. The displaced workers will have to learn the new skills necessary to build and maintain the robots.

White collar workers in the offices of the future also will see some dramatic changes in their jobs. Currently, about 6,000 word lexicons are in use. After a person dictates into the machine, it will type up to 97 percent of what was said. In addition, it can translate the material into nine languages, including Hebrew, which it types backwards, and Konji symbols, which it types sideways and the user reads down the columns. Machines such as this end 50 percent of all clerical and stenographic jobs. But instead of going to an unemployment line, these workers will find jobs controlling the robots in factories with word processing equipment.

Shifting Employment Patterns

As the types of jobs change, so will the definition of full employment. Currently, a 4.5 percent unemployment rate is considered full employment. But by 1990, 8.5 percent unemployment will be considered full employment. This is not as disturbing as it first appears, for at any given time 3.5 percent of the work force will be in training and education programs preparing for new jobs. This will be made possible, in part, because of the job shift patterns. In 1980, 45 percent of the households had two people working. In 1990, this will increase to 65 percent and in 2000, 75 percent of family units will have two incomes. This shift will allow easier entry and exit from the work force to the training programs and back to the work force. Forecasts estimate that every four or five years one of the

spouses or partners will leave the ranks of the employed to receive the additional knowledge and skills demanded by changes in technology and the workplace.

With these changes already taking place, Americans must learn the new jobs now and in the future. Vocational educators and trainers must gear up to provide this vital education and training to the work force of the next two decades for jobs related to robots, lasers, computers, energy and battery technology, geriatric social work, hazardous waste management, and biomedical electronics. Table 1 lists some of the jobs that are disappearing and others that are growing in the shifting job market.

Twenty-two examples of specific occupations of the future, along with training requirements and expected salary ranges are examined in the next part of this chapter. The final section of this chapter will develop several strategies that must be incorporated into our education and training system if we are to meet the demands of our technological revolution.

NEW OCCUPATIONS FOR THE 1990s

The following occupations are among those which we can expect to become increasingly important. Included with each is a short description, starting salary, average salary, and training requirements. The descriptions have been prepared with the assistance of Clyde Helms, president of Occupational Forecasting, Inc.

ENERGY TECHNICIAN

(650,000 jobs starting at $13,000 averaging $26,000)

Jobs will increase dramatically as new energy sources become marketable. Demand will greatly exceed available supply of labor in nuclear power plants; coal, shale, and tar sands extraction, processing, and distribution; solar systems manufacturing, installation, and maintenance; synfuels production; biomass facilities operations; and possibly geothermal and ocean thermal energy conversion operations.

Technicians, inspectors, and supervisory positions will require a high school education and the equivalent of two years of technical college. Already, Toledo-Edison trains many of its nuclear plant personnel with a sophisticated computer-based education system Why? So that as the pace of job changes increases, training can be easily updated.

HOUSING REHABILITATION TECHNICIAN

(500,000 jobs starting at $14,000, averaging $24,000)

In the next 35 years the world population will double, intensifying housing demand. This will lead to mass production of modular housing, using radically new construction techniques and materials. Modular hous-

Table 1—The Shifting Job Market

Some jobs that will be disappearing by 1990

Occupation	*Percent Decline in Employment*
Linotype operator	40.0
Elevator operator	30.0
Shoemaking machine operators	19.2
Farm laborers	19.0
Railroad car repairers	17.9
Farm managers	17.1
Graduate assistants	16.7
Housekeepers, private household	14.9
Childcare workers, private household	14.8
Maids and servants, private household	14.7
Farm supervisors	14.3
Farm owners and tenants	13.7
Timber cutting and logging workers	13.6
Secondary school teachers	13.1

Some jobs that will be growing until 1990

Occupation	*Percent Growth in Employment*
Data processing machine mechanics	157.1
Paralegal personnel	143.0
Computer systems analysts	112.4
Mid-wives	110.0
Computer operators	91.7
Office machine service technicians	86.7
Tax preparers	77.9
Computer programmers	77.2
Aero-astronautic engineers	74.8
Employment interviewers	72.0
Fast food restaurant workers	69.4
Childcare attendants	66.5
Veterinarians	66.1
Chefs	55.0

Sources: Bureau of Labor Statistics
Forecasting International, Ltd.
Occupational Forecasting, Inc.

ing will be fabricated with all heating, electric, waste disposal and recycling, and communications systems preinstalled.

Technicians, inspectors, and supervisors will require a high school education and the equivalent of two years of technical education, plus appropriate experience such as formal apprenticeship.

HAZARDOUS WASTE MANAGEMENT TECHNICIAN

(300,000 jobs starting at $15,000, averaging $28,000)

Despite recent Environmental Protection Agency lapses, many years and billions of dollars may be required to clean up cities, industries, air, land, and water. Additionally, tens of thousands of jobs will be added in each area as breeder reactors and the mining and processing of coal, shale, and tar sands reach commercial stages. When the requirements of collection, transportation, and disposal of radiological, biological, and chemical wastes are included, workers needed could well exceed 1.5 million.

Highly specialized technical training will be required for workers, supervisors, and managers in this very hazardous occupation.

INDUSTRIAL LASER PROCESS TECHNICIAN

(600,000 jobs starting at $15,000, averaging $25,000)

Laser manufacturing equipment and processes, including robotic factories, will replace much of today's machine and foundry tools and equipment. The new equipment, processes, and materials will increase production quality and quantity at lower costs.

High school, technical training, and retraining requirements will vary with levels of skill required under a fast-paced job devolution, the methodology of breaking jobs down into components

INDUSTRIAL ROBOT PRODUCTION TECHNICIAN

(800,000 jobs starting at $15,000, averaging $24,000)

The microprocessor industry will become the third largest industry in the United States, facilitating extensive use of robots to perform computer-directed "physical" and "mental" functions. Hundreds of thousands of workers will be displaced. New workers will be needed to ensure fail-proof operations of row after row of production robots.

Knowledge and skills requirements will compare with present-day computer programmers and electronics technicians. Thankfully, this production change can be planned and introduced in a step-by-step fashion, allowing workers to be retrained while maintaining jobs and some production levels. All that is required is good planning, something our industrial block has had problems with in the last couple of decades. As William C. Norris, founder of Control Data Corporation, a high-technology company, has warned: Unless the technology is managed, we could see a net loss of jobs.

MATERIALS UTILIZATION TECHNICIAN

(400,000 jobs starting at $15,000, averaging $24,000)

New materials are being engineered and created to replace metals, synthetics, and other production substances unsuited for advanced manufacturing technologies. Materials utilization technicians must be trained to work with amorphous and polymer materials and others that may be produced at the molecular level through the process of molecular beam epitaxy, involving atomic crystal growth. In addition, there will be genetically engineered organic materials. These and other "manmade" materials will substitute for natural-element metals and materials now being depleted.

An education equivalent to that of an electronics technician, tool and die maker, nondestructive materials testing specialist, or industrial inspector will be required. Two years of technical college will be the minimum requirement.

GENETIC ENGINEERING TECHNICIAN

(250,000 jobs starting at $20,000, averaging $30,000)

Genetically engineered materials will improve upon and supersede current organic materials and also positively affect some inorganic materials processes. These engineered, "manmade" materials will be used extensively in three general fields: industrial products, pharmaceuticals, and agricultural products. New and modified materials and substances will be produced under laboratory-like conditions and in industrial mass production quantities. Technicians must be educated and trained to work under laboratory-type controls while producing in tonnage lots.

A bachelor's degree in chemistry, biology, or medicine will be helpful in the initial industrial production work, but production operations will be accomplished by process technicians with high school and two-year postsecondary technical education and training.

HOLOGRAPHIC INSPECTION SPECIALIST

(200,000 jobs starting at $20,000, averaging $28,000)

Completely automated factories that use optical fibers for sensing light, temperature, pressures, and dimensions will transmit this information to optical computers to compare the data with stored holographic, three-dimensional images. Substantial numbers of inspectors and quality-control staffs will be replaced.

Specialists working in this new technology will require a minimum of two years of postsecondary technical education and training, with emphases on optical fibers characteristics and transmission, photography, optical physics, and computer programming.

BIONIC-MEDICAL TECHNICIAN

(200,000 jobs starting at $21,000, averaging $32,000)

Mechanics will be needed to manufacture the actual bionic appendage (arm, leg, hand, foot) while other specialists work on the highly sophisticated extensions of neuro-sensing mental functions (seeing, hearing, feeling, speaking) and brain-wave control.

These technicians will require appropriate technical knowledge of microprocessors and specialized accredited education in the respective anatomical, physiological, and psychiatric disciplines equivalent to a minimum of four years of college work. Medical professionals who establish a reputation will move into the higher six-figure earnings level.

AUTOMOTIVE FUEL CELL (BATTERY) TECHNICIAN

(250,000 jobs starting at $12,000, averaging $18,000)

These technicians will schedule and perform tests and services for new fuel cells and batteries used in vehicles and stationary operations, including residences. Such fuel cells may be charged and discharged by direct electric inputs from conventional electric distribution systems, by solar cells, and by exotic chemicals generating electricity within the cells.

These processes include potential hazards but can be safely serviced by technicians with a vocational high school education. While this sounds like an easy matter, public and private elementary and secondary schools currently are just accepting new technology. While the acquaintance with and acceptance of new ideas usually has a snowballing effect, little has been done to date to establish vocational programs in high schools that can lead to jobs.

Some of this, of course, is a change in attitude. Only a few years ago, we convinced kids that they were "dummies" to study mechanics and vocational education rather than college prep in high school. Some educators like Floretta McKenzie in Washington, D.C., have seen the light and are diligently working to establish technical, vocational, and science areas within their systems. McKenzie is leading the way by also using computer-based education.

ON-LINE EMERGENCY MEDICAL TECHNICIAN

(400,000 jobs starting at $16,000, averaging $29,000)

Needs for paramedics will increase directly with the growth of the population and its aging. In forthcoming megalopolises and high-density residences, emergency medical treatment will be administered on the spot with televised diagnoses and instruction from remote emergency medical centers. Despite reports of a forthcoming glut of doctors, they and other

professional and paramedical specialists will become part of emergency medical teams, traveling in elaborately equipped mobile treatment centers.

To meet the needs for more complete treatment on site, education and training must be upgraded to an extent comparable to that required for registered nurses.

GERIATRIC SOCIAL WORKER

(700,000 jobs starting at $15,000, averaging $22,000)

These workers will be essential for the mental and social care of the nation's aging population. By the year 2000, the birthrate of native-born Americans will merely equal the replacement rate—zero population growth. Improvements in food, medicine, and life-extending medical processes will create the need for hundreds of thousands of workers to serve the aged.

Education and experience requirements comparable to those for licensed practical nurse, recreational specialists, mental hygienists, and dieticians will enable GSWs to find financially and physically rewarding employment.

ENERGY AUDITOR

(180,000 jobs starting at $11,500, averaging $15,600)

Using the latest infrared devices and computer-based energy consumption and controlled networking, energy auditors will work with product engineers and marketing staffs in the production, sales, operation, and management of energy conservation and control systems for housing, industrial plants, and machinery. They will help architects and cost accountants achieve significant cost reductions through use of sophisticated heat sensing and measurement devices and systems, appropriate construction and insulation materials, and energy enhancement and recovery systems.

Technicians, inspectors, and supervisors will require a high-school education and the equivalent of two years of technical college education plus appropriate apprentice or on-the-job experience.

NUCLEAR MEDICINE TECHNOLOGIST

(75,000 jobs starting at $18,000, averaging $29,000)

With the advanced understanding of medicines and serums using radioisotopes, a substantial increase in demand for this technologist will be needed. As the isotopes are absorbed in tissues and muscles, diagnosticians can observe functions of normal and damaged tissues and organs and can determine treatment needs and responses to medication in the central nervous, cardiovascular, pulmonary, digestive, and metabolic systems.

Flow of medicines and effects can be traced and viewed directly on computer-enhanced video displays, thus reducing the incidence of surgery.

Technologists must be trained to work in laboratory conditions, become familiar with sophisticated equipment, and be prepared to assist doctors and nurses in handling equipment and patients.

DIALYSIS TECHNICIAN

(30,000 jobs starting at $16,000, averaging $25,000)

With the use of new portable dialysis machines and a greater number of hospital dialysis machines available, the demand for more dialysis technologists will grow.

These technologists must be educated and trained to work under laboratory conditions in a two-year, postsecondary technical education program including a four-week computer-assisted training program and instruction from other dialysis technologists.

COMPUTER AXIAL TOMOGRAPHY (CAT) TECHNOLOGIST/TECHNICIAN

(200,000 jobs starting at $13,000, averaging $20,400)

Though more than a decade has passed since development of this technique for using X rays with computer technology to give sectional views of internal body structures, the supply of qualified technicians has not kept pace with the growth of this noninvasive, diagnostic science and equipment. Jobs for technicians to install, maintain, and operate CAT scanning systems and to assist in the analysis of these scans will offer attractive positions for thousands of qualified people.

Minimum requirements for technicians include two years of postsecondary education and on-the-job training on the actual equipment in a participating hospital or equipment manufacture. Minimum requirements for technologists include two years of instruction in anatomy, biology, and medicine. Fully qualified professionals will need further education leading to a bachelor's degree.

POSITRON EMISSION TOMOGRAPHY (PET) TECHNICIAN/TECHNOLOGIST

(165,000 jobs starting at $14,500, averaging $17,500)

PET scanners are used for diagnoses of disorders of the human brain. Requirements for qualified workers in this field will increase with the growing use of this science, advances in human and computer technology, and research in human intelligence. Due to specialization in several technological and medical disciplines, technicians will be specialized.

Minimum requirements for technicians will include two years at the postsecondary level. They will specialize in equipment, chemistry, physics, or computer programming. Technologists must be qualified at the professional level, including a bachelor's degree. Both occupations will require extensive on-the-job experience.

NUCLEAR MAGNETIC RESONANCE (NMR) TECHNOLOGIST
(350,000 jobs starting at $14,000, averaging $20,400)

Utilizing a giant doughnut-shaped magnet large enough to enclose the patient, NMR enables doctors to see clearly through the thickest bones. Without painful injections of contrast material or the ionizing radiation of X rays, NMR can reveal damage beneath the skull or within the spinal cord. Not only can doctors see internal organs, but they can acutally monitor certain processes occurring within them; blood moving through an artery or the reaction of a tumor to therapy. The NMR machine produces a detectable electromagnetic signal that it feeds into a computer, creating vivid cross-sectional images of the body.

Minimum requirements for NMR technologists will include at least two years of postsecondary education and extensive on-the-job experience. Fully qualified professionals will need further education leading to a bachelor's degree.

COMPUTER-ASSISTED DESIGN (CAD) TECHNICIANS
(300,000 jobs starting at $18,000, averaging $30,000)

New uses for applications of this new design, engineering, and production technology will create hundreds of new occupations for CAD specialists, both professional and nonprofessional. Millions of workers including blueprint file clerks, draftspeople, designers, engineers, researchers, inspectors, secretaries, and artists will find the computer can do more, better, and faster than traditional methods. Whether designing modes of transportation, dwellings, or other products, CAD will affect the education, employment, and ways of work more than any other single technology.

Education and training requirements will include high school diplomas and at least two years of postsecondary technical school.

COMPUTER ASSISTED GRAPHICS (CAG) TECHNICIAN
(150,000 jobs starting at $20,000, averaging $35,000)

Rapid growth of computer-assisted graphics will affect the education, training, and employment of all graphics technicians as no other event in graphics history has. Demands for artists and technicians will increase tenfold, with an unlimited demand for new forms and dimensions of graphics to portray objects, schemes, and scenarios before they are actually produced.

Basic education and training will still include the physics of color, layout, and dimensions, along with instruction on specialized effects attainable through computers, computer programming, and business potentials and effects.

COMPUTER-ASSISTED MANUFACTURING (CAM) SPECIALIST (300,000 jobs starting at $20,000, averaging $31,000)

CAM systems will permit all the design, development, specification, and logistics data to be pulled out of CAD and CAG data bases and be reprogrammed into computer-assisted manufacturing programs. The CAM programs then operate most of the production facility. This permits the attainment of flexible manufacturing cells (FMC) in which every step of producing a product is determined and programmed sequentially for accomplishment without or with minimal human intervention. Education and training requirements must be changed in almost all occupations, especially in industrial and business management and personnel administration.

Education and training will include a high school education and at least two years of training in postsecondary or technical institutions.

COMPUTERIZED VOCATIONAL TRAINING (CVT) TECHNICIANS (300,000 jobs starting at $14,000, averaging $22,500)

Hundreds of thousands of these technicians will be employed in education and training materials development firms as this art becomes a new science to use in programs at all levels and in all disciplines in public and private educational institutions. Using the demonstration capabilities and versatilities inherent in CAD software, in conjunction with the art and color expression of computer graphics, educators and trainers will be able to depict any object and any action with a vividness and dynamism that will produce higher learning benefits than any mode ever employed. Students will be able to assemble or disassemble the most complex mechanisms, construct the most artistic forms, and design dwellings and structures without ever leaving their computer terminals. While "hands-on training" will remain an essential part of vocational training, terminology and work sequencing will be learned at the computer terminal. Textbooks and lesson plans, lengthy lectures, and dissertations will become passe in the coming decades of learning by doing at the computer terminal interface. Up to 75 percent of all instruction will be acquired at the computer console. This will allow teachers to spend much more time helping students learn actual on-the-job work skills with actual products and processes.

Technicians working in this new area will specialize in graphic arts, computer programming, educational and learning theory and practice, and

technical competence in respective vocational technologies. At least two years of technical education after high school will be required.

TRAINING FOR NEW JOBS

To ensure that the vocational education field provides the education and training needed by the labor force of the future, three areas of concern must be addressed: training and attracting competent teachers; changing prevailing attitudes toward education, training, and new technologies; and updating teaching methodology and instructional materials.

Attracting Competent Teachers

Currently, competent teachers are not attracted to the profession due to low salaries and low status. Competent teachers in vocational education, mathematics, and science can earn 50-60 percent more in the private sector. The decline in this profession must and can be stopped. Over the years, teacher education programs have encountered declining enrollments, due, in part, to low salaries, to oversupplies following baby boom years, and to the high status of working in the private sector. To counteract declining enrollments, teacher training programs lowered their standards for entry. This resulted in attracting a lower caliber of student into the program and in making teacher education a curriculum of last resort for students failing in other areas.

To reverse this trend, long- and short-term strategies must be instituted nationwide. Teaching can be made more attractive through the support of administrators and by raising the salaries of teachers, especially in areas of high demand: vocational education, mathematics, and science. Raising the salaries by 20 percent across the board and by an additional 20 percent in areas of high demand, will attract teachers back from the private sector and encourage a higher caliber of student to enter undergraduate teacher preparation programs. The law of supply and demand will work if other constraints, such as inflexible pay scales and tenure laws, are lifted. But standards must not be lowered.

For long-term solutions to assuring a supply of competent teachers, a series of three hurdles must be instituted by teacher preparation programs and departments of education on a national basis:

1. Before acceptance into a teacher education program, students must have scored at least 850 combined total on their SATs and have passed a proficiency test in reading, writing, and computational skills.
2. Before continuing in a teacher education program, students must maintain above average grades (3.0 grade point average or the equi-

valent) for the first two years of undergraduate work (or the equivalent).

3. Before receiving permanent certification, a teacher must pass a competency examination and receive positive evaluations from supervisors, administrators, or peers.

These are not new suggestions; each has been implemented successfully in several states already. The implementation of these standards will not happen without controversy. Witness the furor caused by football coach at The Pennsylvania State University Joe Paterno, and the National Collegiate Athletic Association when they decided to require a total of 700 on the SATs before accepting college atheletes. But for the sake of the teaching profession as a whole, each of the three (entry standards, maintenance standards, and certification standards) must be initiated and maintained on a national basis.

The insistence on higher salaries and other benefits to attract good teaching professionals will raise flags with cost-conscious or bankrupt states and school districts. That is why the promotion of cooperation between the public and private sectors is so valuable in the academic arena. High technology companies have the equipment, research and development systems, and personnel to assist schools and teachers during this transition time.

Requiring each prospective teacher to overcome these hurdles will tighten the profession's standards and limit the numbers entering to the best. The resulting shortage of teachers will raise salaries and attract more from other places. The downward spiral will be reversed and the status of the teacher will rise, along with the salaries and the level of competence. If we do reverse the trend, we may be forced to use teachers from foreign countries, similar to the medical profession's solution to maintaining medical services in rural America.

To relieve the short-term lack of mathematics, science, and vocational teachers, rather than tolerate less than the best, we could arrange to have good teachers or business people in these fields who have retired take a one to two month refresher course and return to the classroom for a year or two. To further alleviate the shortage, we could encourage corporations to make available some of their skilled technical people to provide some teaching.

Along with limiting entrants into the profession to the best our nation has to offer, we must continually update the good teachers we already have. For example, computer literacy for every high school student and every teacher must be required. Inservice programs provided by school districts or departments of education should be available, and every teacher should be able to pass a computer literacy test within four years.

Some colleges and universities have firmly implanted the seed of computer literacy with some good results already. Hamline University in St. Paul, Minnesota, has a computer literacy requirement for its students that is comparable to other required courses such as English and beginning mathematics. No student may successfully leave Hamline without computer proficiency. Now several other private schools in the Minneapolis-St. Paul area are joining the literacy network, among them the College of St. Catherine's, a private women's college. And they *use* the technology, PLATO computer-based education, to *learn* the technology. If teachers do not fill the gap in their skills, they should be phased out on the basis of failing to keep current with the requirements of the profession. If we are to win the salaries and esteem that the profession deserves, we cannot keep deadwood within our ranks.

Changing Prevailing Attitudes

Across the board, the gap is closing between the highest and lowest students. Special programs help the lower students come up to their capacities. However, few programs help the truly brilliant students perform at theirs. Teachers who could teach brilliant students are going into other occupations and are being replaced by less adequate teachers. We only need a few exceptional students and creative individuals to meet our needs; it is not the quantity but the quality that counts. However, those with the potential are not getting the necessary support.

The U.S. Department of Education has recently issued a report which recommends increased support for mathematics and science and revision of high school mathematics and science requirements. These revisions are vital if we are to maintain the lead in technology that we now enjoy, especially since other countries are rushing to close the gap. For example, Russia requires seven years to our two and one-half years of these subjects in high school.

The latest report by the National Commission on Excellence in Education states the problems with the U.S. educational system very bluntly: "If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war." The commission found that some 23 million American adults are functionally illiterate, nearly 40% of the 17-year-olds cannot draw inferences from written material, and two-thirds of the 17-year-olds cannot solve a mathematics problem. College entrance tests show a steady decline in scores in such subjects as physics and mathematics.

We must encourage our youth, especially girls, to be proud of their skills in science, mathematics, and vocational subjects. Students in any of these areas of study should not be made to feel inferior to anyone. Traditional

funding sources, as well as parent/teacher groups, boosters clubs, and other organizations should be encouraged to make money and give funds to "mathletes" and "chemletes" as well as athletes. Students should be given letters in mathematics, physics, chemistry, and vocationally related extracurricular activities, similar to atheletic letters. If students earn letters in two or three activities, they should become two or three letterpersons. Finally, we should be pouring dollars into computers rather than stadiums.

People must be equipped to change. As important as mathematics, science, and vocational skills are, they are not enough. As society changes, so will the skills and knowledge needed to be productive and satisfied. The higher levels of cognitive skills must be learned as early as possible. People must be taught skills in decision making, problem solving, creativity, communications, critical thinking, evaluation, analysis, synthesis, and the structuring of problems to understand what the results ought to be. Make people think. And make people communicate. Already, our well-educated chief executives, who should and do know better, depend on industry lingo to communicate their ideas. The day of the simple sentence, using real, not "synthetic," words must dawn again, or the gap between buyer and seller, maker and user will never be filled.

Updating Methodology and Materials

Keeping vocational education programs up to date always has been a problem. The rapid pace of technological change accentuates and widens the gap between programs and the cutting edge of knowledge. Budget cutbacks make the problem even greater. The same problem has hit industry. Consequently, businesses are turning to computerized training to lessen the cost and, at the same time, maintain or improve the quality of their programs. At the forefront of this nationwide trend is the PLATO computer-assisted instruction (CAI) system developed by Control Data Corporation of Minneapolis.

The application for PLATO are as limitless as the range of business and industry itself. Such diverse industries as manufacturing, petroleum, banking, real estate, finance, aviation, and emergency medicine find PLATO indispensable. Individual companies and associations training with PLATO include, but are not limited to, American Airlines, General Motors, General Mills, Shell, DuPont, Federal Express, National Association of Securities Dealers, Bank Administration Institute, Con Edison, and Merck Sharp and Dohme.

Computer-assisted instruction (CAI) is easily adaptable for short-term training. Many of the unemployed need two or three months of training for a job that will exist. CAI is practical and effective. Currently over 12,000 hours of training make up the body of PLATO, with more added

constantly. The information is up to date. If this or similar programs were implemented in vocational-technical schools, every teacher and every student would have immediate access to the most recent information available. Students could learn theory and related content on the computer. Teachers could then work individually with students for the hands-on training which is so vital in vocational education. This requires a different type of thinking by the teachers. Insecure teachers will feel threatened by the computer if they have not yet become computer literate. The computer is a tool to make teaching more efficient and more effective—not a replacement for the teacher.

This fear is dissipating somewhat as micros march into the classroom. The businesses that sell the technology are somewhat to blame. [Control Data, however, has spent much time helping educators incorporate the technology into the classroom so that everyone—students, teachers, taxpayers—receives the maximum benefits from technology.] And as teachers realize the power they can exert through the computer—introducing and updating courses, record-keeping, administrative functions—the teacher replacement issue will fade.

Maintaining a skilled work force will take an enormous expenditure of resources. Operating training programs in vocational, technical, and industrial facilities 24 hours a day will eliminate much of the need for duplicating expensive equipment. For example, computers can be purchased by the high school vocational education department, using Job Training Partnership Act funds. They can be used from 4:00 p.m. to midnight to train unemployed workers, from 8:00 a.m. to 4:00 p.m. to train high school vocational education students, and from midnight to 8:00 a.m. to train industrial factory workers.

Even more importantly, we must use our training dollars only for jobs that exist or will exist in the near future. In the past the training programs sponsored by CETA did not give Americans what was promised. Sixty percent of the money was used for administration; the remaining 40 percent went into training. Out of this, only 3 percent of the trainees actually obtained jobs. The people were trained for jobs that did not exist and will not exist. For example, until 1979 people were still being trained to be linotype and elevator operators, even though a need for these skills had not been identified for the preceding 10 years. In fact, the equipment using operators had not been manufactured for 15 years preceding 1979.

The new Job Partnership Training Act has tried to correct this by requiring that 70 percent of the funds go to actual training programs, and limiting administration to 15 percent. The remaining 15 percent is designated for basic literacy education and for childcare services for trainees.

CONCLUSION

The jobs of the future are changing in nature. We need to make short- and long-term changes to avoid disastrous consequences. First, we should begin to encourage the unemployed to upgrade their skills and take lower paying jobs as temporary solutions. Next, we need to get our education system back on track to produce educated minds that accept the challenges of the future and want to learn more. Strong emphasis on education is necessary; however, it is not sufficient. We also need training for the occupations of tomorrow. Finally, we must admit where we have gone wrong and do what it takes to make America one of the strongest and most stabilized countries of the future.

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The Mission of Vocational Education and Trends in Training Delivery

Donald F. Averill

If historians were to plot the growth of vocational education in the United States they would find a correlation between eras of high unemployment and the expansion of public involvement in vocational education or employment and training programs. The current attention being given to programs to improve employment is no exception. The United States has experienced one of the longest recessions of the decade. Unemployment has been in the double digit level. With 11 million people out of work, the figures recall the Great Depression.

What is different about our current attention to vocational education is the realization that significant change is taking place in the population, in the workplace, and in the delivery system to prepare people for careers. Several factors have contributed to this change:

- The baby boom of the fifties was followed by the pill in the seventies, resulting in the possibility of true zero-based population growth by 2050. The reality now is that there are going to be less young people entering the labor force in the 1990s.
- Automation, first introduced as a concept in the forties, has changed industry and shifted society from the industrial era to the information era. This has contributed to population shifts to the sun belt and displaced workers in a number of industries.
- Public perceptions of education are at a low point. There is a call for an increase in mathematics and science teaching, a return to the basics, lengthened school days, and improved teacher standards.
- Financing of government functions is in serious condition in several regions of the United States. This has affected education particularly where financing is dependent on the property tax.

These factors have created an impact on the public educational system which has caused political and educational changes as the schools adjust to the conditions. The missions of all public education systems are changing and face new interpretations. Vocational education has not been left out. It is also going through its version of interpretation and change.

EDUCATION VS. EMPLOYMENT AND TRAINING

As the public role in vocational education evolved at the federal level it was oriented toward an emphasis on education. Starting with the land grant colleges of the Morrill Act the emphasis in the public sector has been to provide educational skills to students. The federal government has vested this effort first through the Department of Health, Education and Welfare and then through the Department of Education. Federal priorities have also been vested in the Department of Labor, but there the emphasis has been on employment and training.

Education is now facing the dichotomy of education which is intended to serve the student and training which is intended to serve the business community. Both are important roles which have experienced crossover by the providers of both education and employment and training as they adjust to employment changes, advanced technology, and changes in the public financing of education.

Starting with the National Defense Education Act, the public education sector has become more and more involved in providing training for industry to meet national needs. The interpretation of legislation in the late seventies and eighties has restored an emphasis on short-term training which will meet employer needs. Part of this thrust has evolved from the partnerships which were encouraged through the Vocational Education Act. This legislation brought the education and business communities together to emphasize employment supply and demand in establishing training instead of focusing on students' aspirations. Adjusting training or education programs to reflect current employment trends is necessary. However, what appears to be happening is that the emphasis is shifting to serving perceived employer needs rather than preparing students for employment which will equip them to take charge of their own career direction.

CHANGES IN THE PUBLIC EDUCATION SECTOR

The public sector is experiencing several changes in the way that it provides either education or employment and training. Some of these changes are universal throughout the United States and some are regional in nature. The specific changes are:

- Secondary school programs are experiencing a back-to-basics movement to strengthen general education requirements. The recent study and report to the Department of Education, "A Nation at Risk," has addressed the quality of teachers, the rigor of the curriculum, and the length of the school day. This report has been interpreted as calling for a shift away from vocational education programs, career aware-

ness, and preservice vocational preparation in the comprehensive high school.

- Adult programs, area vocational schools, and regional occupational programs and centers are absorbing the responsibility for preservice and short-term training as this role is abandoned by the high schools. These programs by nature are oriented toward placement as well as transfer to higher levels of education within vocational fields. Some of these programs have started to work with industry, particularly where adults are included in the training and where economic development efforts are preparing employees for new or expanding businesses. These programs have also continued efforts to provide the classroom training component of apprenticeship programs.
- Community colleges have experienced the greatest change in their roles. Preemployment programs continue to play an important part in community college programs. But the colleges now find that students want short-term training for upgrading and career change. Employers are working more directly with the colleges to develop the vocational curriculum, to use the colleges for upgrading of employees, and to contract for employee training in the company setting. Economic development in various regions and programs to meet the needs of displaced workers have utilized the community college effectively.

Meeting Changing Needs

Public education has reacted to meet the changing needs of the students being served. There is a shift to more specific training that will get people directly to work. The infusion of federal dollars has parlayed this effort into federal programs, state programs, and programs that work directly with employers. Much of this effort was generated in pursuit of financing to keep the doors open as enrollments declined. However, the effort resulted in both students and employers being better served. In the case of the community college, the students found out how to use the system to meet their own needs. A California study of vocational students over a five-year period showed that most students were achieving their occupational goals. The study also revealed that the average student was taking only one course, and that, for the most part, students were not seeking transfer or certificates requiring a full two years of study.

INVOLVEMENT OF THE PRIVATE SECTOR

There are several types of providers of vocational education in the private sector. However, the typical image of the private provider is the proprietary school which offers short-term intensive vocational programs, often spec-

ialized in one occupational area. This for-profit operation has become a major business, with at least three companies listed on the New York Stock Exchange.

A 1983 study by Wilford Wilms identifies some 2,300 accredited proprietary schools and 6,000 for-profit colleges serving approximately one million students. On the whole, proprietary students spend more time in class, graduate at a higher rate, and pay more of their own money for college than other students. The study states that about 56 percent of proprietary school students come from families earning less than $6,000 a year, compared with 41 percent of public college students and 18 percent of private college students.

The National Center for Educational Statistics finds that a whopping 65 percent of the postsecondary schools offering job training last year were profit-making ventures. Of 9,208 postsecondary institutions with occupational programs, 6,013 were proprietary schools. Another 1,291 (14 percent) were private, nonprofit institutions, and 1,904 (20 percent) were public schools. Only 53 percent of the proprietary schools were accredited, compared with nearly 85 percent of the private nonprofit schools and 89 percent of the public schools.

Nearly 25 percent of the 9,208 postsecondary schools were classified as cosmetology/barber schools, 14 percent were business/commercial schools, and 11 percent were community/junior colleges. Most of this effort is oriented to preemployment training to get the student into the marketplace. Very little work in the proprietary schools is for the purpose of upgrading or career ladder change, as in the community college.

Employer-Provided Training

But by far the greatest proportion of job-related training in this country is provided by employers rather than by educational institutions. A recent survey found that industry offers about 68 percent of all job training compared to 32 percent by educational institutions. The training costs employers $20 billion to $30 billion annually, according to an American Society for Training and Development (ASTD) study conducted by Harold Goldstein and Anthony Carnevale. These figures include funds spent for in-house training and training provided at other locations.

The number of employees trained directly by employers about equals the number enrolled in higher education—11 million, according to the study.

The ASTD study, based on Census information, found concentrations of training among types of workers, industries, and occupational fields. Of the employees trained by employers, 63 percent are men, who make up 57 percent of the labor force.

In addition, the data showed that the workers who have the most training are likely to get more. White collar workers make up half the work force but receive 75 percent of the training provided by employers. Among white collar workers, 16 percent of the training goes to professional and technical workers—twice their rate of participation in the work force. Blue collar workers, on the other hand, make up 31 percent of the work force but comprise only 19 percent of those trained. Only crafts workers are trained in proportion to their proportion of the work force—13 percent.

Training by Type of Industry

Among types of industries, the breakdown of in-house training is as follows: 29 percent in service industries, including medicine and education with 21 percent in manufacturing and dwindling smaller percentages in other industries.

The nine industries represented in the study trained most of their employees in-house. Here are the percentages of employees trained by their own companies in their respective industries: mining, 77 percent; wholesale and retail trade, 69 percent; transportation and public utilities, 67 percent; finance, real estate, and insurance, 55 percent; agriculture and manufacturing, 54 percent; construction, 50 percent; and services, 43 percent.

Job-related training performed outside of industry was carried out by schools and college (63.5 percent) and organized labor, community-based organizations, and government agencies (36.5 percent). Among educational institutions, four-year colleges offered 35 percent of the training; two-year colleges, 19 percent; and vocational, trade, and business schools, 7 percent. Particular types of training were favored at different kinds of educational institutions: professional, managerial, and sales workers at four-year institutions; clerical, service, and blue-collar workers at two-year institutions; and craft workers at vocational and trade schools.

PUBLIC SECTOR INVESTMENT

The current interest by the federal government in employment and training over vocational education can be illustrated by the dollar expenditure being made through this funding source. In the 1982 fiscal budget the expenditure for employment and training was over one billion dollars while the expenditure for vocational education was only $650 million.

Government interest in linking the public education sector with the business community to provide job-related training has also received a great deal of attention from the states.

The southeastern part of the United States was the first to link economic development to the public schools by providing employer-related training

for companies moving into their states. This model received considerable attention from the vocational education community and was the subject of a study by the American Vocational Association. This pattern of linkage was most successful in the area vocational/technical centers and the community colleges.

California has provided dollar support for a program administered by the Employment Development Department under the California Worksite Education and Training Act. Twenty million dollars was provided to California's community colleges and regional occupational programs to spur this type of business linkage. In the last fiscal year, the state completed the first year of its "Invest in People" project, which was the brainchild of former Governor Jerry Brown.

The Job Training Partnership Act (JTPA) provides an increased state role in vocational education, and at the local level, at least for these federal dollars, the business community will have an increased voice in how the federal funds are spent. The dilemma which the education community still faces will be the interpretation of how the expanded employment and training partnerships called for by JTPA will affect the vocational education roles of the institutions which have been more student centered.

BUSINESS/EDUCATION LINKAGES

The vocational education community has a well-established, working relationship with the business community. The great programs have always been organized to draw upon the expertise and participation of industry to establish program direction, to provide support, and to work with the students. The growth and success of vocational student organizations such as the Distributive Education Clubs of America (DECA), the Future Farmers of America (FFA), and those in other occupational fields attest to the fact that teachers and students long ago recognized the need for partnerships.

What is happening now is that public school administrators have also seen the value in these partnerships and for the first time are promoting their expansion. Major attention has been given to the movement through prestigious efforts such as "Putting America Back to Work," the joint program of the American Community College Trustees and the American Association of Community and Junior Colleges. This program has the two-fold purpose of informing the business community about the community colleges and forging new partnerships to involve the colleges in job-related training.

The American Council on Education, the American Vocational Association, and other professional associations have also studied, commented

on, and encouraged the linkage of business and industry with educational institutions.

Now the federal government's efforts will be incorporated into the linkage relationship as the states implement the Job Training Partnership Act. Unfortunately, this legislation has introduced a new player into the linkage in the form of city and county governments representing the geographical boundaries of the JTPA service delivery areas. These government entities, which often have little or no direct role in educational governance, are given an administrative role in the implementation of the law, which could leave vocational education institutions with a very weak voice.

Implications of Current Trends

The expenditures being made by the private sector, particularly business, in the area of broad educational programs point out the interest in industry to have broadly educated employees. Companies are contributing to advanced degrees, providing enrichment and personal use programs, and even investing in recreation for their employees. Job-related training is not the only priority of the business community. Surveys show that the business community wants employees with strong basic skills, an increased level of mathematics and science preparation, and work attitudes that will contribute to the productivity goals of the business.

If this is the case, then the preoccupation of legislative bodies with relegating all linkage or partnership funding to the job-related or employment and training effort is misguided. The business community also has a vested interest in employing well-educated citizens who have learned to take charge of their own career futures. This is a time when employees need to move away from the dependence they have developed on their employers and strike out on their own. Building such attitudes among the employee population will accommodate change in the industrial community more readily than the paternal attitude which is now evident in many training programs. To create this attitude, linkages need to be strengthened in the vocational education environment, more so than in the employment and training environment.

EMPLOYMENT DATA: THE WEAK LINK

Major concern has been expressed both by the business community and politicians about the fact that some occupations seem to be oversupplied while others, particularly technical level occupations, are undersupplied. The simplistic explanation is that if education were doing a better job of matching employment needs to training programs the problem would be diminished or disappear.

There unfortunately is a thread of truth in the statement, and that truth fuels the dialogue about controlling programs so that oversupply does not occur. Several factors are forgotten as this argument is used. They include the following:

- The American free enterprise system was not established on the tenet of controlling supply and demand. In fact it is the conditions of the free marketplace which often make it difficult to make accurate predictions on employment trends.
- The major problem is not the information shortage, but getting job opportunity information to the student through the form of guidance programs.
- Timing in getting the employee ready at the exact time that an employment need exists is complicated by the other demands that are placed on the educational system to provide a broad, comprehensive education.

The dialogue which is now developing needs to use the forums of business round-tables to address in true perspective the needs of the educational program in preparing all levels of employees and in supporting the continuing educational needs of these employees. Linkage in this area may assist in breaking the information log jam that has prevented education and the business community from doing more effective employment and training planning.

DISPLACED WORKERS

The jury is still out on the new government programs designed to serve the displaced worker. The cooperative investment by General Motors and other corporations along with labor and government entities has had mixed results. There are success stories and there are failures where individuals entered and completed training but failed to find work. It is hard to determine if the programs were put together with insufficient planning and therefore failed to meet employer specifications, but the programs are certainly not reaching expectations.

One of the problems faced by the planners of these programs is the social environment from which the students come. The workers who have been displaced are older, with established homes and social lives, families in school, and other roots in the community. Such entrenchment is hard to change, especially if new employment cannot be found in the same setting. Many of these workers drew high pay for limited skills. Receiving training and then entering new employment at reduced pay is hard for them to deal with.

Poor employment data, lack of research to identify proven methods of dealing with change and displacement, and a need to identify methods of

dealing with the social issues which arise all strengthen the need to forge partnerships between education and industry. These partnerships must address both the employment and training needs which face industry daily, and also the education needs of the employees to enable them to enjoy productive and fulfilling life-long careers. Neither the employment community nor the education community has all the answers, but there is a need to find them.

SUMMARY

There have always been linkages of one type or another among the effective vocational programs of the United States. Developing partnerships is not a new idea; however, it has caught the imagination of the nation. As a result, considerable attention is being given to business/education partnerships by legislatures and by top administrators and leaders in education. It is this attention which is unique and needs to be capitalized upon.

The stimulus for these partnerships has been rooted in resolving the unemployment problem of the country as it relates to the changing structure of business and the consequent displacement of large groups of workers. That stimulus has also had financial overtones as traditional methods of financing have changed and the former populations served by some institutions have declined. In addressing the linkage or partnership theme, the education community finds it must consider the dichotomy of vocational education, which focuses on students, and employment and training, which focuses on employer needs.

Government involvement in the partnership theme has increased over the last five years through support given to economic development efforts, state programs for displaced workers, and the recently enacted Job Training Partnership Act. These efforts have placed a political aura over the linkage efforts as city, county, and state involvement is overlaid on existing efforts between business and educational institutions.

Stimulating a stronger linkage between the business community and education is important. However, a perspective needs to be given to the purposes of these linkages. Addressing immediate employer needs is an important aspect of such partnerships, but attention also must be directed toward student needs. If the country is to deal with evolving technological changes and other industrial changes, it will need to help workers to take command of their own careers. There is a need to restructure the educational process to make life-long learning an integral part of the work environment. Such shifts in education will require improved working relationships between industry and education to create an environment in which expanded educational involvement by the work force will be economically feasible.

The nation faces a new frontier of knowledge, information, and change. Roles for industry and education need to be defined, and plans need to be formulated for implementing programs that will benefit both industrial needs and the needs of the worker. This is an exciting opportunity for both education and industry.

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A Rationale for Collaboration: The View from Industry

Richard E. Clinton

The massive economic and technological changes affecting the American workplace have implications that are yet only dimly perceived. One result, however, is certain. The confluence of forces creating jobs in some business sectors and eliminating them in others will create employment dynamics of profound significance and consequence.

One certain way that business organizations can help alleviate critical skills shortages and address the massive problem of unemployment is by promoting greater collaboration nationwide between education and training institutions and the private sector. A major focus of the effort should be on correcting the basic skills deficiencies of youth seeking employment to make them more trainable for today's and tomorrow's new jobs. The effort also must focus on retraining the millions of displaced workers who once worked in basic industries that are giving ground to increased foreign competition and who also are affected by the rapidly growing service and technology industries.

The United States must address the problem of meeting the employment aspirations of millions of young people while coping with irreversible structural changes in the labor market and attempting to recover from a major world wide recession. Not to suceed in both endeavors would create an ever-widening gap between the new jobs that are being created and the skills of available workers. This potential gap is compounded by a disparity between where these new jobs are being created and where many of the displaced workers now live.

NEED FOR A NATIONAL POLICY

It is fairly safe to say that no clear, national policy on manpower, education, and training exists in America. Existing programs are characterized by a highly fragmented responsibility among public agencies. These programs lack meaningful coordination between public and business training activities. Historically speaking, federally sponsored public sector vocational training programs have focused principally on the young and the

culturally disadvantaged unemployed. There is no denying the seriousness of this problem or the scope of need. But many "advantaged" people, including many already employed, are or also will be in need of training.

Some observers increasingly believe that public and private institutions and programs operating independently and without national policy position, may well prove unequal to the challenge of preparing America's workers for tomorrow's jobs. The sheer magnitude of the task facing our country today, let alone that of the future, is too great for any one segment of our society to accomplish on its own. Training policy reform and the programs and facilities in the public and private sector must be coordinated and brought together in such a way that the participants can perform those aspects of the total effort for which they are best equipped.

A New Opportunity under JTPA

While the nation's training policies may be deficient overall, recent changes in federal legislation and a number of successful programs at the regional and state level offer the foundation for some solid improvement. Perhaps one of the strongest reasons for industry to support public/private sector collaboration is the new Job Training Partnership Act (JTPA). It provides the private sector the opportunity to influence and help guide the direction of a portion of tax-supported public education.

The JTPA program, which came into effect in October 1983, replaced the Comprehensive Employment and Training Act (CETA) of 1973. Unlike CETA, the JTPA program focuses on job training, not job creation. It is designed to provide for greater involvement of the private sector in employment and training programs. Representatives from industry and education will function as delegates to state-level coordinating councils and to local private industry councils (PICs) that will put industry representatives in full partnership with local government.

The JTPA will have a limited effect on current unemployment. It is aimed principally at addressing long-term structural unemployment issues. In a true partnership with local government officials, business representatives can assist in the determination of long-term training goals for their respective states and communities. Implementation of the law will mark the first time that the private sector has equal responsibility with government in shaping federally funded job training programs.

The JTPA offers the private sector unprecedented latitude in exercising influence over local job training activities. While compliance with the process is important, performance will be rated more on return on investment, the quality of the training and placements, and the reduction of welfare dependency. Without positive participation by the business community, the JTPA will also fail to achieve any real success.

PRIVATE SECTOR INITIATIVES

Given the present Administration's demand for local, mostly private sector job training initiatives, it becomes increasingly necessary to integrate business development with long-range job creation and manpower development policy as it evolves. A successful coordination of the responsibilities and capabilities of the public and private sectors is fundamental to this effort.

Corporations traditionally have worked with schools in developing career awareness and vocational education programs. However, with cutbacks in education budgets, they are being asked to do more to help develop curriculums that provide graduates with the problem-solving and decision-making skills needed in a technology-intensive work place; to help fund elective, extracurricular, and enrichment programs; to provide equipment that has been cut out of budgets; and even to lend their expertise to the financial management of school systems.

Keeping Training Current

A major problem facing schools is keeping education in tune with the needs of the workplace. Until recent years, vocational education and academic education have maintained somewhat separate curriculums. However, as advances in technology continue to affect office and industry jobs that require an upgrading of the skills of entry-level workers, distinctions that once might have been made between academic and vocational curriculums are fast diminishing. The distinction is a particularly nettlesome problem for the many displaced workers whose past training was, at best, narrow and who now find it difficult to make the transition to today's and tomorrow's job opportunities.

The gap between academic training and vocational training will continue to narrow as employers and educators realize that all workers need both types of training to become and remain effective employees. However, as vocational education and career awareness programs fall victim to budget cut-backs in order to save basic subjects, companies will be required to expand their support of these programs.

Business must assume a greater role in curriculum development if workers are to be trained for the jobs of the future. Planning boards that bring together business, labor, and the schools will increase in importance. The quality of public education will continue to be a factor in the location and relocation of corporate facilities. A recent University of California at Los Angeles study concluded that proprietary schools generally prepare students better than public schools do because they respond more readily to the needs of the labor market. Better communications between the public

school educators and the planners in business and industry will go a long way toward correcting this deficiency.

MODELS OF COLLABORATION

For businesses looking for reasons to support and collaborate with public education, Lee Hamilton, assistant vice president of the National Association of Manufacturers, cites three:

- *Corporate Citizenship:* Business firms consider their work with schools as one means of discharging a community, public service responsibility.
- *Financial Investment:* Local taxes tend to be a significant cost of doing business, and businessmen are interested in getting the best possible return on their education tax dollars in terms of efficiency, productivity, and achievement of goals.
- *Employee Supply:* Industry needs to have a reliable source and continuing supply of well-educated potential employees.

Examples of Company/School Partnerships

There are numerous models of company/school partnerships. Because many of these programs are only a few years old, much has been learned through trial and error. A key to starting a partnership is learning from those who already have improved the process. Following are several examples of successful model partnerships already in place.

- General Motors Corporation established contracts with about 45 community colleges to train service technicians for its automobile dealers across the country. GM teaches about its products and procedures to faculty members who, subsequently, will train about 180,000 technicians each year.
- Insurance companies have engaged in a cooperative effort to train body shop workers and insurance claims people in how to repair the new generation of unitized body cars. A group called the Inter-Industry Conference on Auto Collision Repair has been developed to create the required vocational education courses.
- The San Mateo County Community College District in California and a consortium of telecommunications companies in the San Francisco area are developing a pilot program to train about 200 telecommunications technicians a year to fill jobs with local companies. The consortium provides a model for comparable programs around the country.
- Private Initiatives in Public Education (PIPE), a non-profit organization supported by Seattle's business community through corporate membership fees, allows companies to have one-to-one corporate/

school partnerships. PIPE's board of directors includes representatives of the supporting businesses, the Parent-Teachers Association, the Urban League, the Seattle Teachers Association, and the School Board. Now in its fourth year, PIPE has 13 firms partnered with 11 high schools and 2 middle schools. Eight hospitals have also been brought into the program to provide career enhancement opportunities for high school students.

- North Carolina's 58 community and technical colleges and an advisory council to the governor, representing about 20 companies, launched a program in 1981 of business-industry-college cooperation. The program resulted from a survey that showed that many employers did not know what type of education or training was available at local colleges.
- Chicago's Career Development Centers are operated in conjunction with Chicago United, an organization established to work with the school system in running career exploration programs. These programs attract about 1,000 junior and senior high school students annually. Career fields covered include air transportation, maritime studies, merchandising and retailing, urban studies, life and health science, hotel/motel management, and computer science. Students earn academic credits by attending half-day classes to learn about an industry, either at school or at an employer's location. Approximately 300 companies participate.

Partnership Is Good Business

High schools, community colleges, and companies in the private sector are initiating alliances as they come to realize that it is simply good business to cooperate to provide educational opportunity. Today, states such as North Carolina, Ohio, and South Carolina are entering contract relationships with business to provide a job-specific as well as a broadly trained work force for industries that locate in their states. This type of employer-specific training meets the needs of both the educational institutions and the corporations. The college faculty gets access to state-of-the-art techniques and equipment. The companies get access to instructors whose expertise many of them could not afford or provide on their own. This is particularly true for the proliferation of new and generally smaller businesses, many of them spawned by new technologies and service opportunities. These businesses are expected to be the primary source of new jobs but may lack the resources for carrying out internal training programs. A recent Brookings Institution study estimates that fully 50 percent of the jobs created between 1974 and 1980 were in brand new companies.

Views That Hinder Collaboration

No doubt, both industry and vocational institutions maintain some misconceptions about the other sector. Some in business still view vocational education as second-class learning. They regard vocational schools as little more than a last-resort alternative for school drop-outs and dismissals. They consider them to be like the vocational programs of the 1950s that, for the less academically inclined students, provided domestic and secretarial skills for girls and shop courses or agricultural training for boys.

The school systems, whether at the secondary or community college level, need to do the best job they can to promote themselves as providers of quality technical and general education. They must show themselves as capable of delivering customized or prescriptive training and the academics necessary to produce well-rounded graduates who can adapt to inevitable future changes. Vocational school administrators need to create opportunities for business people to have more face-to-face contact with their students to help change some lingering negative images in the business community about their schools.

WHAT BUSINESS WANTS

Some people in the education community may still hold the view that industry's interest is limited to wanting worker drones with job-specific skills. In some situations that still may be so. But increasingly companies desire more than just skills from public education. They want graduates with positive attitudes toward work, self-motivation, and behavior patterns suitable for their particular business environments. There is probably no better way to do this than by a time-sharing program that makes industry people available to students in their classrooms and gets students into the workplace for a firsthand view and even part-time employment.

An educational rationale for increased collaboration with the private sector is provided by Willard Wirtz, chairman of the board of trustees of the National Institute of Work and Learning in Washington, D.C., and former U.S. secretary of labor. He has this advice for school leaders: "Schools that become isolated from the rest of the community become isolated from the knowledge of what it takes for youth to participate in those other institutions, from how employing establishments view the developed abilities provided by the schools, from the resources throughout a community for enriching and extending the educational process, and from the reserve of goodwill potentially existing for furthering educators' objectives, recently buffeted by public discontent and criticism."

Advanced Technology's Impact

The advanced technologies that already are being introduced in service industries will continue to affect work in such businesses as communica-

tion, transportation, banking and finance, and insurance. The rapid advances in computers during the past two decades and the explosion of computer-related jobs are a classic example of how the technological creation, obsolence, and replacement process works and how it creates jobs.

A massive upgrading of skills will be required, if displaced clerks are to become computer operators and programmers, or machine operators and assemblers are to become computer repair technicians and systems analysts. More complex machines and more sophisticated technology require better trained and comparably skilled workers. The increased use of robots also eliminates jobs, creates new ones, and increases the need for training and retraining.

Many observers fear that our generally low-tech educational programs threaten America's high-tech future. The decline in the quantity and quality of technical education in our elementary and secondary schools has decreased our ability to retrain current workers for these new jobs. Technical illiteracy will do much to constrain the ability of many businesses to adapt their work force to changing products and markets.

Most retraining of current employees will be done in house. A great deal can be done in the public sector, and the quality of future graduates and workers can be assured if business will cooperate with the various forms of public education to help them upgrade their curriculum and teaching practices and adapt them to a changing business and industrial world.

Several industries are already providing supplemental aid to help local schools modernize their course offerings. At both the elementary and secondary school level, companies are "adopting" local schools, developing programs, providing equipment, and loaning employees to work with students and faculty. While local schools districts generally coordinate and run them, Adopt-a-School programs are kept flexible to take full advantage of the expertise and resources of various employers. Companies can provide employee time, material and equipment, curriculum development, career counseling, and, eventually, employment opportunities. Currently operating in about 20 city school systems, this type of interaction provides collaborative models of industry in action. They also highlight the need for a sound grounding in the basics of mathematics, English, and the ability to think critically. The best programs do not focus narrowly on job-specific training.

Closing the Gap Between School and Work

Often a mismatch exists between the skills required for available or projected job opportunities and some vocational educators' perception of what performance requirements are. We are experiencing an unprecedented rate of technical changes affecting both production methods and equipment. It

is important that educational institutions be made aware of these changes.

The experts in state-of-the art technology and its applications are and, of course, always will be in business and industry. It is difficult to simulate the environments in which this knowledge will be applied. Thus, industry training, of necessity, must be used to close the knowledge gap. However, it is wasteful of both public and private resources when business and industry continue this training beyond the time that new skills and equipment reasonably can be introduced into the public education system. Through collaboration, business can ensure that such training will meet its needs.

Academic Credit

A rather special example of collaboration between educational institutions and the business and industries they serve, and one particularly worthy of special mention, is the Program on Noncollegiate Sponsored Instruction conducted by the American Council on Education (ACE). This program reviews and evaluates courses offered by nonacademic organizations (business, professional, industrial) to identify those that merit credit toward the completion of a junior or senior college degree. The ACE has recognized that a great deal of high quality, formal learning occurs within business as well as within government organizations and professional associations where millions of people engage in formal training each year.

An example of this type of cooperative effort is the agreement recently reached between Philadelphia Life Insurance Company and Peirce Junior College, Philadelphia. Academic credit is granted for successful completion of the Fellow Life Management Institute courses that are taught by the company's training department. These credits, when combined with business and academic courses taken at the college, make it easier for employees to earn an associate in science, life operations management degree. Such cooperation for adult training is a logical step toward wiser use of public and private educational resources. It permits company trainees to concentrate more on management and professional development and yet offer and provide for needed employee skill development. This program also should be welcomed by educational organizations facing a need to expand the population they serve in the face of future and, in some cases, present declining enrollment.

Need for Career Counseling

Career counseling is one important aspect of the educational system, which is particularly amenable to cooperative industry support. Preparation for vocational counseling does not seem to be a major thrust in curricular

programs for students preparing for careers as high school counselors. Usually, only one or two courses are directed specifically to work-related information on counseling.

A 1980 survey by the Southern Regional Education Board established that certification requirements for courses specific to vocational counseling and the number of related items on competency examinations for certification varied. But the courses and items did not constitute a great emphasis in any of the states surveyed. Unless vocational instructors and counselors have had significant industrial work experience, they will not be well-versed in matters of business and industrial working conditions, current and changing entry-level skill requirements, and the on-the-job performance requirements.

Unless local employers cooperate with local school personnel, it will always be difficult for students to make realistic career choices from among the myriad of occupations available to them. Without assistance from industry, neither public school faculty nor the most motivated vocational counselors can fully help their students understand the occupational futures available to them. These problems can cost employers time and money as the new workers try to sort out their career goals.

Cooperative efforts could offer almost limitless ways to keep faculty up-to-date and students well-informed about career choices. Local employers can be included either in formal counselor relationships or in less formal structures, whose purpose is to create a relationship through which the school and business personnel can work effectively.

The cooperative agreement worked out early in 1983 between the Newport News Shipbuilding and Dry Dock Company and the York County (Va.) Public Schools provides a good example of what can be done. To familiarize guidance counselors with the types of jobs available in the shipbuilding industry, the company provides for visits by school guidance counselors to a variety of its work sites. These visits familiarize counselors with the types of jobs available. The program also provides them with additional knowledge needed to counsel their students to make realistic career choices. Selected students also will be able to work in the areas of engineering and computer science for a period of six weeks during summer vacation. And groups of 25 eighth grade students will be provided with introductory presentations to include a general tour, films, and discussions of various occupations found in the company's work force, and entry-level requirements. This experience will permit students to observe firsthand the technology required to run a major industry and will help them make a positive transition from high school to the world of work.

The shipyard also provides advice and counsel to help the school system establish an Educational Assessment Center. The center will help students

make better educational choices. Further, the Newport News Shipbuilding Management Development Center offers school systems managers and supervisors a two-day management development program conducted by the company's training staff.

CONCLUSION

The utilization of millions of unemployed, underemployed, and often unskilled Americans whose joblessness will resist even a significant upswing in the economy and the concomitant retraining that may be necessary to qualify them for new jobs is clearly an awesome task. More and more unemployed Americans lack either the academic or functional skills required by the new jobs emerging in high-technology industries, in existing industries that are using these new technologies, or in companies that are being created to exploit them. If these people are to work again productively, they must be retrained and, perhaps, even relocated.

Of equal, if not greater significance, is that large numbers of young people continue to leave the public school system woefully unprepared for the world of work. Many of them still lack the communications, mathematics, and scientific skills and knowledge that will be essential for even entry-level employment in future decades.

How well and at what pace the public sector and American businesses and industry succeed in meeting critical current and future economic challenges will depend significantly on how well and at what pace today's and tomorrow's workers are trained, retrained, and upgraded. To succeed will require no less than the best collaborative efforts between the private sector and public education.

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Requisites for Collaboration: The View from the Financial Community

James M. Howell and Linda D. Frankel

All businesses consider a number of factors important to their success and profitability. Business executives consistently report that the availability of skilled labor is one of the most important factors in deciding where to locate or expand. Thus the success of vocational education systems in providing skilled labor has a substantial effect on an area's attractiveness as an investment site and, ultimately, on its economic well-being.

Three important issues will have substantial impact on the success of vocational education in meeting the training needs of financial institutions in the future: the training of entry-level workers, the diversification of training needs, and the ability to overcome barriers to collaboration. In each case specific actions can be taken that will lead the way to a more productive and rewarding relationship between vocational education and the financial community. In addition, there are model programs which can be adapted to the training needs of banking and other financial institutions.

A FINANCIAL PERSPECTIVE

Before discussing the vocational education-financial community relationship, however, it would be helpful to explictly acknowledge the experiences that have shaped our views. First, we are neither personnel administrators nor human resource specialists. The views in this chapter are shaped by more than a decade of experience as the chief economist of a major northeastern financial institution. Over the past decade, the Bank of Boston has contributed substantially to the economic revitalization of New England. By all measurable criteria, these revitalization efforts have been impressive. Today, the New England states enjoy the lowest unemployment rate of all industrialized states in the country.

Unquestionably, the bank's traditional role as a loan packager and venture capital financier was an important part of this revitalization. But even in the early part of this process, the bank chose to pursue a much broader role, acting as a regional facilitator to bring together key institutional leaders to foster communication and encourage nontraditional economic development efforts.

Second, this chapter is shaped by the authors' involvement in the work of the Council for Northeast Economic Action, a nonprofit, public policy, research, and technical assistance organization that, in its seven-year history, has evolved into a substantive institutional mechanism to foster collaborative solutions to complex problems. A number of these efforts have involved vocational education.

Finally, we should note that we have considered vocational education in its broadest possible context. Indeed, in this chapter, we consider vocational education to be any type of training related to employment, whether at the secondary, postsecondary, or even postgraduate level. Having established these general perspectives, let us turn to consideration of the training needs of the financial community.

TRENDS IN THE FINANCIAL COMMUNITY

The financial community is in an era of rapid change and growth, which reflects the continued structural transformation out of manufacturing into a service economy. The financial sector is, unquestionably, at the cutting edge of the move to an information society. Another part of this change is the swing to interstate banking with a significant increase in competitive market practices among many different kinds of financial institutions.

Against this backdrop, the industry's training needs are substantial. While those needs are not fully understood, three important patterns or trends are emerging that will have a significant impact on the future relationship between financial institutions and the vocational education system.

- Demand for entry-level or near-entry-level workers will increase significantly faster, approximately 50 percent faster, than aggregate private labor market demand in the 1980s, and the jobs themselves are likely to become more simplified, not more complex. Consequently, increased attention should be devoted to basic skills. Specialized work readiness skills will become more important for high school graduates filling entry-level jobs.
- As the New England economy continues to evolve and develop a strong service sector, training needs will diversify. In the past, vocational education has been heavily oriented to manufacturing "benchwork" type training. In the future more flexibility will be required on the part of the educational providers to meet these new demands.
- Historically, the financial sector has been reluctant to participate fully in government sponsored training programs, even those directed specifically to meeting their vocational needs. Future program design and operation should focus on encouraging the participation of financial institutions in training programs.

THE PROBLEM OF ENTRY-LEVEL WORKERS

To state it simply, the financial sector has a vigorous demand for entry-level labor. Our somewhat rough estimates support the view that within this industry nationally there are over one million entry-level or near-entry-level jobs. Further, conversations with personnel officers in large financial institutions indicate that their demand for personnel for entry-level positions will increase at the annual rate of 4.2 percent over the balance of the decade, or roughly 50 percent faster than aggregate private sector employment demand.

In the greater Boston area alone there are 27 medium-to-large financial institutions, employing approximately 65,000 people. Of this, approximately 14,500 jobs are at entry- or near-entry-level. This represents 22 percent of total employment in one of the fastest growing industries in the area.

In addition to the rapid increase in entry-level jobs, the jobs themselves are becoming less complex. This reflects the reality that while service sector industries are growing more complex, labor-market demand in many key occupations is becoming more simplified due to greater reliance on sophisticated computers. For example, ledgers and books for major clients are no longer maintained manually, but are now part of the automated data entry process. Before this operation was computerized, bookkeepers maintained individual books and ledgers for all large clients. The job required somewhat sophisticated knowledge of the transactions and books. Now, however, the task requires only that a CRT operator know how to punch in the appropriate numbers. The computer automatically enters the information in the proper account and adjusts the current balance. The bank has more accurate and timely records, yet it does not need as many highly skilled bookkeepers as it used to. Instead, there is a greater demand for entry-level data entry CRT operators.

Decline in Job Preparation

Disturbingly, however, high school graduates, who are the logical pool for filling the increasing numbers of more simplified jobs, are experiencing a precipitous deterioration in the quality of their preparation for employment. The experience of the Bank of Boston is as vivid as it is disquieting.

Experience has shown that more than one half of the bank's new job applicants are unable even to complete the employment application form in a satisfactory manner. It is quite obvious that these individuals, as well as those who find themselves employed and only slightly better educated, have a very limited growth potential in any industry.

The trend toward increasing numbers of more simplified entry-level jobs and the inability of applicants to meet the most basic skill requirements suggest two complementary directions for vocational education as it seeks

to meet the training needs of the financial community. First, the vocational education sector should direct a part of its programs to the growing numbers of entry-level jobs in the service sector. Second, basic skill training—most importantly in reading and reasoning skills—should be considered an integral part of the overall mandate of vocational education. Lacking these basic skills, a job applicant has little future in the labor market.

Need for Basic Skills

For those already employed in the financial sector, vocational education, in addition to providing specific job-related skills, should emphasize basic reading and reasoning skills. We are unaware of any widespread effort to address this need among those currently employed. What success has been achieved has been the result of ad hoc efforts. Clearly, this is an area where greater dialogue and collaboration between those in the financial community and those in vocational education could be extremely productive.

For those still in a formal educational setting, the stress on basic skills is no less important. In addition, our experience indicates that adding job readiness skills to the basic reading and reasoning skills of the lower quartile high school students, who comprise a substantial part of the entry-level labor pool, can have a dramatic effect on later job performance.

Motivation and Job Readiness

Jobs for America's Graduates (JAG), a three-year-old national demonstration project, was designed to provide job readiness skills while simultaneously raising career motivation. While not designed explicitly to address the labor market needs of the financial community, JAG has achieved impressive results in this area. Based on the experience of the Council for Northeast Economic Action in starting and implementing one of the six national test sites for JAG, we conclude that students receiving special attention in the area of motivation and job readiness skills—resume preparation, interview techniques, work attitude sensitivity—find jobs more easily and perform better than students who have not benefited from the program. Specifically, an evaluation of the performance of students participating in the program at the Delaware site shows that after nine months, the JAG students were earning on average nearly $1,000 more annually than a control group of similar students who did not participate, and that more than twice as many JAG students (57 percent) received raises as did the control group (28 percent).

In designing programs for financial institutions, vocational education should be structured to take into account the projected growth in the simplified, entry-level jobs by emphasizing basic reading and reasoning skills, and by providing specialized job-readiness skills to those in the labor market who will fill entry-level positions.

THE NEED FOR DIVERSIFIED TRAINING

In addition to the entry-level training requirements, financial institutions require training for more complex occupations. If training needs remained constant, or evolved slowly (as they used to in machine-tool and manufacturing industries), then vocational education systems could analyze skills needed for particular jobs, develop appropriate curriculums, and offer free-standing training programs to prepare people for those jobs. On graduation, students who passed through these programs would be fully prepared for available jobs. Unfortunately, in the service sector, particularly in the financial industry, job needs and job categories are changing constantly. In effect, there is now a constant need for skills upgrading, most of it for short periods of time and as a direct part of a current job.

Industry Training Options

In such an environment, graduates of free-standing programs tend to be prepared for jobs that no longer exist. At best these graduates require additional skills upgrading in order to perform the jobs available upon graduation. Very little of that onsite skills upgrading involves the vocational education system—or any education institutions at all. Instead, there is an entire industry of consultants, training firms, and an increasingly large number of corporate trainers. Personnel departments are growing to include trainers, curriculum specialists, and training managers (who are responsible for purchasing training from outside). This so-called "shadow education system" is direct evidence of the speed with which training needs change and of the difficulty the formal education system has had in responding to those changes.

Yet the current situation will only intensify: service sector training needs will continue to change constantly, as will specific job categories. Some means must be found to bring the formal education system in direct contact with those evolving training needs. In order to keep current, free-standing formal education must have more contact with the evolving onsite training needs that are part of continuous upgrading. In short, the analysis of job skills leading to curriculum design must include a "research and development" component based on current onsite training for employees.

High Demand for Skills Training

Our experience in Boston confirms the constant, large demand for skills upgrading and training. One way to define the size of this demand is to look at budgets. Informal conversations suggest that the five largest banks in Boston, representative of similar banks in large cities, spend nearly $3.5 million each year for inhouse training and another $1.5 million each year in individual employee tuition-reimbursement programs to improve the job skills of current employees. Those budgets are growing every year.

Despite the size of these training programs, there is a general consensus that the process of matching training needs with training capacity is still random and inefficient. Training directors typically must rely on personal knowledge of vendors and on an informal network of other training directors who make referrals to consultants and training firms. There is no systematic way to refer these needs to the formal education system. As a result, although there are consistent, growing budgets for training, there are still very large areas of training needs that are not being met at all.

Here too, collaborative partnership building will have a high payoff. Indeed, the Council for Northeast Economic Action has developed an imaginative clearinghouse project in this area, called the Corporate-Education Exchange. The purpose of the exchange is to systematically match industry training needs with college and university training capacity. To do this the exchange represents more than a dozen colleges and universities interested in designing and delivering training programs for businesses and is currently offering its services to more than 375 businesses throughout New England.

Roles of the Corporate-Education Exchange

Because the exchange combines business users and education providers, it is able to serve two valuable roles. First, it increases the involvement of the formal education system in inhouse training. Second, the exchange improves the match between training needs and training programs, and thus brings current training needs closer to free-standing curriculums. Each individual training request transmitted throughout the exchange produces programs specifically tailored to that request. Generic, off-the-shelf programs are adjusted to specific needs, and entirely new programs are developed for unusual needs. Over time, this will lead the formal education system to more closely match training needs by significantly increasing its market information.

Because each participant in the exchange is aware of all training programs requested through the exchange, training providers have a much more accurate picture of the actual market for training and can adjust their plans accordingly. Similarly, training directors can review their internal programs in light of the specific training being done in other businesses and can identify emerging needs more quickly.

It is still too early to evaluate the success of the exchange, but it appears to be a useful start in more efficiently matching training needs with training capacity in the formal education system. Such arrangements offer one way to help meet the changing and increasing need for internal training in business, particularly as the economy shifts even more to service sector and other knowledge-intensive enterprises.

THE NEED TO REDUCE BARRIERS

A number of programs aimed at preparing the young, the unemployed, and the unskilled for jobs have been created by Congress during the past two decades. Despite some notable successes—in particular, certain Title VII programs in CETA—the financial community has shown a clear preference to avoid participating in the programs. Indeed, our experience shows that even when bankers have chosen to work with the Title VII program (or other similarly mandated programs) they have limited their role to helping nonbanking—especially manufacturing—firms receive greater support from the programs.

Through our experiences in working with banks on labor training issues, we have been able to arrive at some understanding of this limited participation in, or at least hesitancy to become involved with, these programs. Among the business sector at large—but certainly in the financial community—there is a widely held belief that it is often a waste of time to become involved with governmentally funded vocational education programs because they are the captives of the bureaucracies that operate them. Experience in chairing a large and active private industry council in Massachusetts for the past four years has shown there is some truth to this generalization. Developing a working knowledge of the intricate governmental regulations and procedures can be most time-consuming.

Duplication and Confusion

Perhaps the issue of organization is more important than time or some of the political maneuvering, which bankers often find unfamiliar and disquieting. The various training programs have evolved independently of one another, resulting in a duplication of activities. This has been especially true in the case of the vocational technical high schools and CETA-funded skill centers. As a result, it is not an exaggeration to state that most bank personnel and training officers are confused by the maze of training programs and do not know what programs can be most helpful for their organization.

Yet there is reason for optimism. The need for broadly defined vocational training is apparent. Nonmanufacturing industries—especially finance—will generate significant numbers of new jobs in the future. Training will be necessary for the entry-level positions, but there will also be a strong and consistent demand for skills upgrading and other more sophisticated efforts. Clearly there is a need for more dialogue between the financial industry and the vocational education sector.

Fortunately, a mechanism to stimulate and shape that dialogue is at hand. The Job Training Partnership Act of 1982 strengthens and expands

the state role in job training. The changes that will be introduced under this legislation are significant, shifting to the state level responsibilities for local plan approval and fiscal oversight that previously were the province of the U.S. Department of Labor. This shift of organizational authority combined with reductions in federal job training funds (in 1979 the Massachusetts state training budget was $300 million, in fiscal year 83, $67 million) offers an ideal opportunity for state planners, local educators, and the business community to join together with a common goal of improving vocational and training programs.

A Rationale for Collaboration: The View from Labor

Jack Reihl

Labor has a long relationship with private industry and an equally long-standing commitment to vocational education. Most people in the labor movement today understand that the future of our vocational education system and our apprenticeship and other training programs is a vital issue. We have a lot at stake and much can be gained from successful collaboration.

Labor's participation in vocational education derives from its concern for quality workmanship and public education. Thus, from labor's perspective, the success or failure of collaboration will depend on its impact on our schools, retraining efforts, and jobs. And, after all the fine speeches on partnership have been delivered, labor will take a hard look at how well this collaboration helped workers to meet the challenges of the new technology.

LABOR'S CONTRIBUTION

Labor has a lot to contribute in this new partnership. Apprenticeship programs, for example, provide a sturdy cornerstone upon which an effective partnership can be built. Each year 300,000 workers enroll in apprenticeship programs. Annually, 100,000 skilled workers complete apprenticeship. This makes apprenticeship programs the largest private sector training program for skilled workers.

By their nature, apprenticeship programs require a collaborative effort between business, labor, government, and the community. Private industry needs well-trained workers and a stable work force in order to make gains in productivity and competitiveness. Advisory committees made up of management and labor establish standards and schedules of training. Government plays a role by publishing acceptable training standards and, with joint apprenticeship committees, supervising program activities and providing a fair credentialing system. Vocational education does its part by furnishing necessary related instruction.

Joint apprenticeship and training committees must continue to keep up with new materials and technology as they are introduced into industry. Curriculums must be kept up-to-date to guarantee that workers who have already achieved journeymen status can utilize the latest techniques and materials. In the building and construction trades, this can be done through trade extension programs. Workers in industrial unions can gain this training in skill improvement programs. The community benefits as workers are trained for good, well-paying jobs. Moreover, the influx of newly trained workers, especially in sectors with great potential for growth, helps to foster economic recovery that benefits everyone.

Advantages of Apprenticeship

Apprenticeship is a fine example of how partnership can work. It is a private and voluntary program. It combines on-the-job training with related instruction to produce workers with skills that are both verifiable and marketable. Moreover, unlike federal programs that seem to change with every new administration, or various "quick start" training plans, the apprenticeship system is a well-established institution in America. In fact, the apprenticeship system goes back to the middle ages when local and, later, national government established standards to guarantee quality workmanship, as well as fair working conditions for apprentices. A commitment to enhance our apprenticeship programs, especially through public vocational education, will draw support from organized labor and from working people across America.

Need for Support

In many states, the vocational education system has been particularly responsive to the training needs of our workers. This cooperation should continue, but it is threatened today by a stagnant economy and reductions in the quality of education. As a result, our vocational and technical education systems are working under the pressures of limited budgets. In many of our schools, administrators have had to delay purchases of up-to-date equipment. In others, funds earmarked for staff development have declined. In many schools, curriculum modification in newer growth industries has been stalled because of budgetary constraints.

Meanwhile, millions of workers are thrown out of work. Many look to the vocational education system, but the schools are not prepared. Rather than using the time a worker loses on the job due to unemployment to upgrade or retool in areas where skilled workers are needed, these students are put on waiting lists for the courses they need. What makes this shameful waste all the more irrational is the important fact, noted recently by the Joint Economic Committee, that the most important factor in determining

the location for expansion of high technology industries is not tax breaks for businesses, but the availability of skilled workers.

Needs of Vocational Education

Our public vocational education system must be funded at levels that are sufficient to train and retrain adults in new technological skills. They must learn on up-to-date equipment. And vocational education instructors need to be able to learn the latest state-of-the-art in their respective fields. Around these goals, our partners will find labor a strong collaborator. Utilizing its well-established political programs, organized labor can aid vocational education by working in the legislative arena to obtain sufficient funding.

Need for a "Good Job"

The whole idea behind apprenticeship and skilled vocational education is that a good job is better than just a job. American workers want jobs that require quality work and pay decent wages. Consider the sage advice a master carpenter recently gave to one of his struggling young apprentices: "Any job that you can master in only ten minutes of work can be taken away from you in less than ten minutes." Such advice would be easily understood by the more than one million workers who have lost their jobs in steel, auto, textiles, rubber, and the railroad industries and are seeking to retrain.

DEMANDS OF TECHNOLOGY

Ultimately, the success or failure of collaboration will depend upon how well this partnership helps us to adapt to the technology. Today we face a new crisis involving technology and labor. This crisis will challenge our economy and values. If we understand the causes and dimensions of the crisis, we will create a better future for ourselves, our children, and their children. But, if we refuse to understand the crisis or take special action, America will fall behind and the quality of life that has defined the American dream will become the domain of privileged few.

We can identify the crisis by considering three relatively recent phenomena. First, technological advancement, specifically the growth of high technology and robotics, is changing the face of production and the process of work. This has intensified a second problem: unemployment. More than ten million Americans are without work and are slowly being pushed to the margins of society. At the same time, we can foresee a future shortage of skilled workers in several key sectors of the economy. These are vital issues that our vocational education system faces.

By now, we all have heard a great deal about high technology. One of labor's chief concerns is with the mix between high technology and established industry. Clearly, every state and city cannot have a Silicon Valley. The field is growing so rapidly and changes are occurring so constantly that abandoning established industries for a full-scale shift to high technology would be foolish. Similarly, offering large tax incentives as a form of venture capital will shrink state revenues at a time when states face substantial shortfalls.

Growth in Low-Tech Employment

A growing body of evidence demonstrates that high technology alone cannot lead us to recovery. Indeed, Henry M. Levin and Russell W. Rumberger from Stanford University claim in a recent article that while high technology will require more computer operators and related jobs, the new technologies will also provide opportunities for business to further simplify and routinize work tasks. The authors state that the expansion of the lowest-skill jobs in the American economy will greatly outstrip the growth of high-tech jobs. For example, the Labor Department predicts that the number of computer operators needed in the 1980s will reach 150,000. However, 1.3 million new jobs are projected for janitors, nurse aides, and orderlies. Similarly, the department claims that the need for data processing machine mechanics will increase to 100,000 jobs. Meanwhile, 800,000 new jobs are projected for fast food workers and kitchen helpers.

A high-tech strategy might have two aims: first, to integrate new technologies into existing manufacturing bases and, second, to help initiate and expand high-tech industries that are appropriate to the needs and resources of a given state or city. The emphasis might be more on the first aim in some areas and on the second aim in others. A good deal of evidence suggests that many of the best opportunities for jobs and retraining might be found through innovation in products and services that are related but not entirely dependent upon high technology.

Adapting to High-Tech Through Retraining

In Wisconsin, for example, most development plans are built around a continuation of the balanced economy that the state now enjoys. The most important impact of high technology will be in applying the latest technology to existing production processes, such as robotics in automobiles and other manufactured products. In addition, high-tech components should be integrated into products. A company that produces carburetors will have to design its products to include new micro-electronic elements.

Because of its position linking the practical world of work with technological advancements and new skills, the vocational and technical

education systems will play a key role in adapting high technology to our needs and resources.

At first glance, it seems paradoxical that we should face a shortage of some types of workers at the same time when millions of workers are out of work. If the world were as simple as the graphs and statistics we always rely on, the problem could be quickly solved by moving the unemployed workers into the areas where we need workers with new skills. But the task is not so easily accomplished in the real world. That is why apprenticeships, vocational education, and retraining will be so important. Workers have always been concerned with new technology and the ways in which that technology affected their work and their lives. To American workers, new technology meant more production. More production meant lower prices and greater demand for products. Owners made more profits and workers were able to demand raises in wages that corresponded to the increased productivity.

Vocational Education's Response to Technology

This happy picture, however, was punctuated at certain times when technological advances threatened job security or when there was a gap between new technology and the skills of the work force. At these difficult times, vocational education emerged as an important element in bridging the gap between technology and labor. In the first decade of this century, new technology demanded highly skilled workers in manufacturing and agriculture. Vocational and technical systems in several states were founded in order to meet this new challenge. Later, during the dark days of the Depression, the vocational technical systems worked closely with New Deal programs that emphasized adult training and education. At a time when private enterprise was unable to provide jobs and training, the vocational and technical schools worked with government, labor, and industry to help train an entire generation of workers for public works programs.

The rush of workers into the armed services during World War II produced a gaping need for skilled workers on the home front. Vocational education programs across the United States responded. In Wisconsin, 43 vocational and adult schools provided concentrated training for occupations that were critical to the war effort. These centers operated 24 hours a day, seven days a week, in order to meet the challenge and to fill the gap between technology and labor. With the end of the war, these efforts continued as the vocational education system became a primary delivery mechanism for the transition of military personnel to civilian life and work roles. With an emphasis on automotive technology, electronics, and mechanical technology, students trained in these vocational education pro-

grams placed themselves on the cutting edge of productivity gains in the 1950s and 1960s.

TODAY'S CHALLENGE

Today, a similar kind of effort will be needed for recovery. To retool and retrain in order to put America back on the leading edge of industrial change will require a new level of collaboration between industry, labor, government and the community. It will require a national strategy of reindustrialization and a curbing of tax incentives for industries that export our jobs and technology overseas. Without a national industrial policy and fair trade laws, our efforts in the area of vocational education can achieve only a limited success. Similarly, if private industry avoids working closely with organized labor and attempts to shape vocational education around a narrow and self-serving agenda, then collaboration will have a hollow meaning. Increasingly, working people are asking questions about the quality of life, the nature of work, the impact of technology, and what the future holds. True collaboration—a partnership of several equals—will go a long way toward answering these vital questions.

SECTION II

Issues in Collaboration

Collaboration has the potential to affect the way both education and the private sector do business. Perhaps the most profound effects will be on the schools, which must alter their curriculum, teaching practices, facilities use, and staff development programs to be able to work effectively with business and to turn out students who are ready for effective employment. In fostering collaboration, barriers must be overcome on both sides of the partnership.

Jerome Moss, Jr., considers whether vocational education is ready for collaboration. He examines what collaboration will mean for vocational education and how collaborative efforts will affect vocational *education* as opposed to vocational *training*.

Gayle Jasso describes some of the barriers that will have to be dealt with if business is to be willing to collaborate with the schools. In addition to exploring the constraints to collaboration, she also portrays the ideal situation which would make it easier for industry and business to work with the schools.

Collaboration will affect the way educational institutions operate their programs. Don C. Garrison examines the impact of collaboration on a comprehensive postsecondary institution. He describes the ways in which the institutions and businesses will need to work together and some of the new structures that will have to be developed.

What impact will collaboration have on governance and how will governance affect collaboration? William Payne and I describe the varieties of governance, and how some governance structures are being changed to address the new educational and economic realities.

Employer-employee contracts affect education/industry collaboration in complex ways. Harold D. McAninch and Joan Bevelacqua explain the issues that need to be resolved before entering into partnerships.

B. Lamont Carter

Is Vocational Education Ready for Collaboration?

Jerome Moss, Jr.

Vocational educators are being urged to begin to collaborate with business and industry in joint training efforts. Whether collaboration will remain voluntary or will be mandated by legislation reauthorizing vocational education remains to be seen. Whether collaboration is really in the long-term interest of society and the student/trainee has yet to be critically examined. The purpose of this chapter is to initiate the examination.

"Collaboration," in the sense that it is being used, goes far beyond the concept of "cooperation." The latter typically refers to voluntary agreements between autonomous units, entered into when it happens to suit each organization's purposes and serves a mutual interest. "Collaboration" implies a more continuous integration of effort toward common purposes with shared authority and responsibility. It describes a partnership rather than simply a supportive relationship. As William Kolberg, president of the National Alliance of Business, put it in a speech in Dallas, January 17, 1983, "job preparation and training will be more effectively done if trainers and job suppliers work closer together as *equal partners*" (emphasis added). Under a fully collaborative arrangement, business and industry would not just advise and assist vocational educators; they would join in providing training, share in authority for what is done, and be held equally responsible for the outcomes.

Organizations representing both large and small businesses are advocating the need for a strong, formalized employer role in the design and delivery of occupational programs. For example, in recent testimony dealing with the reauthorization of the Vocational Education Act, the U.S. Chamber of Commerce insisted that educators could not "prepare their students for the rapid change of tomorrow's labor markets unless there is close communication, understanding, and partnership between the business and vocational education communities." It seems an appropriate time to ask the following questions:

- Why the pressure for a partnership with business and industry?
- What is such a partnership likely to mean for vocational education?
- What are the factors to consider in deciding about collaboration?

WHY IS COLLABORATION SOUGHT?

Vocational education administrators are understandably reluctant to give up any of their hard-won autonomy, but there are several reasons why collaboration with business and industry may be necessary and even desirable.

First, concern about economic development is forcing state and federal governments to look upon vocational education as a tool for increasing productivity. The logic is that productivity can be raised by technological advance which requires better, more highly trained new workers; opportunities for employed workers to receive upgrading and updating experiences; and retraining to alleviate inevitable structural unemployment and to assist those (particularly females) who reenter the work force after a period of not working outside the home. In addition, many states want to attract or hold firms by using employee training capability as an incentive. Consequently, it appears desirable to governmental units that vocational education should be linked more closely with employers to enhance education's capacity to react to changes in work force requirements and to play a more active role in job creation.

Second, there will be increasing competition within business and industry and from the armed services for the fewer youth, especially white middle-class youth, who will be entering the labor force in the years immediately ahead. Business and industry firms would undoubtedly like to compete by having as much as possible of the occupational preparation done under their control, to suit their special training needs, and at direct public expense.

Third, many economists have seriously questioned the economic value of vocational education, particularly secondary-level vocational education, under the present governance/management structure. Strengthening the tie with business and industry is seen as one way of improving the placement rate in directly related occupations and, therefore, the economic payoff to society.

Fourth, many educators have argued that specialized occupational preparation has no place in the secondary school. Closer linkages with business and industry can be seen as a way of beginning to move vocational education out of the secondary school by letting business and industry assume increasing responsibility for it, a point noted in a 1979 study by the Carnegie Council on Policy Studies in Higher Education.

Thus, many different groups—including state and federal governments, business and industry itself, economists, and some educators—see collaboration with business and industry as a desirable and necessary step for vocational education.

WHAT MIGHT COLLABORATION MEAN?

The Dual Purposes of Vocational Education

Since 1963 vocational educators have been trying to balance their dual obligations to the individual and to society. On the one hand, vocational educators have been asked to serve "people needs." That is, to meet the needs of individuals by making accessible to everyone education that will increase individual options and enhance opportunities for occupational choice and satisfaction. On the other hand, vocational educators have been asked to serve society by meeting its work force needs as efficiently as possible, that is, to consider the talents of individuals as a resource to be developed in the interests of the economy.

This duality is classic; it epitomizes the distinction between education and training. *Education* is a process of rearing, bringing up, developing, and fostering growth and expansion of knowledge and other desirable qualities of mind and character that will be of positive value to the individual in the society in which she or he lives. *Education* uses knowledge and skills to liberate individuals from the bondage of ignorance by expanding options; it is a process done primarily in the interest of the student. *Training* is shaping or developing individuals, through drill and discipline, to attain clearly determined, readily demonstrated goals. Training uses the learning process to mold and control individual behavior toward specific goals that are needed by society; it results in conforming behavior.

As vocational educators strive to meet their obligations to individuals, they are educating. As they emphasize the efficient satisfaction of societal needs they are more likely to be engaged in training. This distinction is *not* made here because of any intrinsic difference in the ultimate value and quality of education vs. training (although philosophers may argue about such differences). The distinction is made because as business and industry become active partners in the public vocational education enterprise the character of the programs provided is most likely to move considerably toward the training end of the continuum. The reasons why collaboration is sought, the self-interest of business and industry, and the proclivities of most vocational educators would seem to dictate that direction.

Program Implications

The differences between the extremes of vocational "education" and vocational "training" can be understood in terms of their goals, evaluative criteria, programs, students, curriculums, methods, staffing, and institutional patterns. Presuming that a collaborative relationship is established, vocational programs will take on more of the characteristics of training activities, as follows:

1. Goals will focus on the preparation of individuals to fit into the jobs needed by society. Decreasing attention will be given to enhancing individual capacity for occupational choice, versatility, and satisfaction.
2. Criteria to evaluate program effectiveness and efficiency will center on individual employment and earnings and upon cost per placement in the occupations for which training was provided. Much less attention will be paid to cost per value added to the individual throughout a career, or to non-economic criteria, such as vocational development and goals intrinsic to the learning process, for example, basic skills and dropout-rate reduction.
3. Programs will be established on the basis of projected occupational vacancies or changing requirements due to technological advances; projections will attempt to be precise, medium-to-short-range, using local and state data. Programs will not be justified primarily on the basis of potential student demand.
4. Numbers of students served will be determined by local and state labor market demand, and students may well be selected to maximize the likelihood of subsequent training and job success. Program access will not be equally available to all who wish to enter and who may benefit from the least restrictive learning environment.
5. Curriculum content will be drawn from an analysis specific to an occupation or firm and the work role as defined by the prospective employer. Curriculum length will be as short as possible with considerable attention to periodic updating. Less emphasis will be placed upon "long" programs designed to maximize occupational transferability, transportability, and employability. Curriculums that redefine work roles to better satisfy individual needs, provide remediation for basic skills, or otherwise use occupational content as a vehicle for general education purposes will not be favored.
6. Behavior modification techniques designed to achieve prespecified minimum levels of performance on selected occupational competencies will be employed. Actual on-the-job settings, such as apprenticeship and cooperative programs, will be used increasingly. Little or no deliberate attention will be given to the cognitive development of students or to maximizing their occupational potential.
7. An increasing proportion of the instructional staff employed by the school will be part-time and temporary in order to keep current with specific occupational requirements. Close working relationships will also be developed with the training staffs employed by business and industry.

8. The institutional setting most facilitative of the programs described above are open-entry, specialized vocational schools. These will be favored over the more traditional comprehensive secondary or multipurpose postsecondary institutions. The gap between academic and vocational programs will be widened.

DECIDING ABOUT COLLABORATION

The decision about whether or not to collaborate with business and industry—or rather, the extent of collaboration that is most desirable in different parts of the vocational enterprise—depends on a multitude of factors. Some of those factors are presented below, organized under the catagories of general factors, preparatory programs, and updating/upgrading programs.

Some General Factors

It is reasonable to look at the experience of other countries for guidance. Many of the industrialized market economy nations, such as Japan, Sweden, France, and Denmark, have evolved close, long-standing working relationships between their occupational training efforts and employers. According to Beatrice G. Reubens, however, there is relatively little to be learned from them. These nations have in common active participation of employer and worker organizations in planning and operating vocational courses, but school-based skill training appears to be gaining on industry-based training, especially in the more technological fields. Most significantly, the differences among nations in collaborative models are great, and no country appears to have a model entirely satisfactory to itself, let alone suitable for replication elsewhere.

Consideration of some of the basic trends that seem to be restructuring the world of work in the United States should be instructive in reaching decisions about the desirability of collaboration. First, we are rapidly shifting from a mass industrial society to an information society in which the strategic resource is no longer capital but knowledge and data. This will lead to a break-up of mass instrumentalities and encourage an explosion of entrepreneurial activity. Second, we are now a truly global economy and are in the process of sorting out who is going to make what in this world. Developed nations like ourselves will have to look to new technological adventures in order to maintain strong economies. Third, at the same time that the demands of an information society and competition from other countries are forcing us toward high-tech enterprises and greater proportions of complex, rapidly changing occupations, the psyche of the American public is demanding high-touch activities and greater humaniza-

tion of the workplace. Jet airplanes have only led to more meetings, and the high technology of word processors has revived handwritten notes. The dismal downswing in the production rate may be reflecting the demand by workers for greater occupational satisfaction. Creative management may become as important as creative technology in improving the rate of production, according to John Naisbitt.

Another important general factor to consider is some of the limitations of business and industry training and of vocational education. The private sector cannot disregard its organizational goals to assume a genuinely educational function; it cannot be a profit-making and a social service agency at the same time. There are, therefore, real limits to whom industry will train, for how long, and for what on its own initiative and expense.

The private sector has flourished because it trains only when it has to and because it has screened out the hardest to train. On-the-job training, for example, is effective only when the number of trainees is small in relation to the number of workers. The corollary is that public funds are best used to encourage private sector training when it is in the public interest but not necessarily in the private sector's interest to train. Such conditions include the training of the disadvantaged and training that will spur technological advance.

It is also necessary to keep in mind that vocational education does *not* affect overall placement—the total number of people who get jobs. Overall placement is determined by the number of jobs available. But vocational education *does* affect the redistribution of unemployment—who gets what jobs—by influencing who is best qualified for what jobs through training. It is only in the long run that training can affect the amount and nature of work by permitting technological change and by setting worker expectations for working conditions.

Preparatory Programs

Providing access to training that will result in an equal opportunity for occupational choice, placement, and satisfaction is a fundamental responsibility of democratic societies, and carrying it out justifies public expenditures. Opportunities for preparatory vocational education should be provided regardless of fluctuations in the economy (temporal or geographic) whenever students are willing to invest their time and effort and when there is a reasonable probability that they will benefit from the instruction. In these cases value will be added to the individual. We cannot afford to create greater frustrations among minorities and disadvantaged citizens by tolerating inequalities of opportunity for occupational preparation. We cannot, for example, permit labor-management negotiations to dictate who

will be prepared to enter various occupations. By far the best way to ensure equality of opportunity, as well as to take advantage of economies of scale (given the numbers of persons to receive preparation), and to serve small as well as large employers, is to continue to lodge responsibility for preparatory programs with the public schools.

Further, the vocational program that will provide the most functional occupational preparation for the future can probably be offered most efficiently by the public school. The program, in other words, should be weighted toward the education side of the education-training continuum. Experience with professional-level occupations has demonstrated that the more complex the occupation and the more rapidly it is expected to change, the more attention should be given to the fundamental knowledge and basic skills that undergird the occupational specialities. And in the future, skilled and technical-level occupations are expected to become more cognitively complex. Instruction for cognitively complex occupations can best be provided in the simulated environments found in formal educational institutions. Instruction should emphasize the transferable elements of the occupation, encourage exploration to better ensure later occupational satisfaction, and demand mastery by the student of the relevant tools for learning, relearning, and advancing in the occupation.

The preparatory programs offered by public schools should be limited to those occupational areas in which instruction will result in an economic advantage to the graduate. Employers must be willing to demonstrate that the competencies learned have real value to them; otherwise the student is wasting his or her time and the school is wasting the public's money. As Lester Thurow has pointed out, occupational specificity of preparatory programs should depend upon elasticity of substitution; the more substitutable the competencies among occupations the greater the argument for combining them in training. The acid test for the proper breadth of a program is the relative economic value of its graduates in the eyes of prospective employers.

Updating and Upgrading Programs

Consideration of many factors appears to suggest that preparatory vocational programs should be weighted toward the education end of the education-training continuum, be offered in the public school, and depend upon cooperative rather than collaborative relationships with business and industry. However, examination of other factors suggests that updating and upgrading programs would probably benefit from more collaborative efforts.

Retraining may be like either preparatory or updating/upgrading depend-

ing upon the extent to which the worker's existing knowledge and skill base is used in building a new set of competencies. The more the new base differs from the existing base, the more retraining is like initial preparation.

Equality of opportunity for access to training is not as great a problem with updating and upgrading programs because they are designed to serve persons already employed in the occupation, and those are the people employers want to serve. The tendency of the private sector to reduce training activities during periods of recession would not be as damaging since updating and upgrading programs do not control the flow of potential new workers to the occupation.

With greater access to equipment, facilities, and practitioner-instructors, business and industry firms are more capable than schools of providing training in the highly specialized, applied aspects of occupations. Firms also are in a more sensitive position to perceive the need for and the nature of the desired training. At its best, private sector training can be integrated with the redesign of jobs to better satisfy human needs at the same time new technical requirements are accommodated. And the profit motive is ever present to make the delivery of instruction as efficient as possible.

Finally, a public investment in upgrading and updating programs may be justified on several counts. It can be a spur to needed technological advances. It is a subsidy designed to keep the productivity of our work force competitive in world markets. It can cover the cost of training employees who want updating or upgrading for their own reasons, as well as those the firm feels need the training.

CONCLUSION

As it is now practiced, vocational education can hardly be described as a unified system; it is decentralized and highly diversified. Programs can be found that exemplify all points on the education-training continuum. If collaboration is to be voluntary, decisions will be made locally based upon specific incentives, personal experiences with the Job Training Partnership Act, and the quality of existing personal relationships with business persons in the community. All varieties of collaboration will result, and the present diversity of practice will be reinforced.

If, however, Congress wants to exert leadership in this aspect of vocational education, it may decide to mandate some type(s) of collaboration. In that case, the profession will need a position. As argued above, we should advocate "collaboration" with business and industry in the conduct of upgrading and updating programs, but probably stay closer to our traditional forms of "cooperation" for the conduct of preparatory programs.

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Why Business Finds It Hard to Work with Schools

Gayle Jasso

With all the talk today about how wonderful and important public/private partnerships are, people would probably be shocked to know that most relationships between schools and business do not work. They are far from partnerships. They are, in fact, "near misses." Although the projects intend to do much good, players are often harmed even though they do not receive a direct hit.

There are many reasons why business finds it hard to work with schools. Many educators: (1) have little interest in working with business because it requires a new approach and extra effort; (2) have tunnel vision; (3) have unbusinesslike standards; (4) lack strong leadership skills; (5) require too much red tape; (6) lack concern or understanding of business's needs, worries, or problems; (7) expect one-way giving; (8) worry about their turf; (9) take business for granted; and (10) fear that if business gets involved, it might do a better job, and where would that leave schools?

ESTABLISHING PRODUCTIVE RELATIONSHIPS

Rather than pointing fingers, studying the general reasons why typical collaborative efforts do not work is a more useful approach to establishing productive school/business relationships.

School/business collaboration often fails because of these misses: mistrust, misunderstanding, misestimation, mismanagement, mistreatment, misusage, mistakes, mismatches, misvalue, and miscarriages. These problems can be avoided, but both sides must approach one another with a clear commitment to the belief that working together will be far more beneficial to all concerned than working separately.

Without this commitment, in all probability, the costs will not seem worth the benefits, especially for business. With this commitment, however, many doors will be opened. Students will receive some of the most challenging and useful learning opportunities they will ever experience. Schools will receive resources they could never afford. Employers will receive better prepared graduates. Everyone wins!

Winning plays a major role in the success of school/business relationships. If all players win, the relationship will work and may even blossom into that lofty dream called a "partnership." If the players only look out for themselves, then either a near miss or a direct hit will result, and everyone will lose.

A Success Story

One of the most successful vocational education/business partnerships in the country exists in California between the state's entry-level job skills training program called Regional Occupational Programs (ROP) and Security Pacific National Bank. This partnership works successfully on two levels.

The first level is a grassroots relationship between local ROPs and 44 percent of the bank's 649 offices throughout the state. ROPs which offer banking classes utilize Security Pacific's local offices for on-the-job training. Approximately 1,000 students were trained by the bank during the 1981–82 school year.

On the second level, this cooperative spirit develops into a sophisticated partnership. Through Project STEP, the bank's Skills Training Educational Program, the bank offers over 110 classes a year on Saturdays and in the evenings. These classes are conducted with 12 ROPs throughout the state.

Through Project STEP, the bank provides, at no cost to ROPs, utilization of 41 bank facilities as classrooms, plus use of the latest equipment and training materials. The bank also provides current and skilled full-time bank employees to teach these classes after bank hours, when the facilities and equipment are not being used by the bank. These teachers are a key reason for the success of the program. In addition to being responsible for the bank's resources, they are also current in job skills, technical training, and industry trends.

The ROPs play an equally important role in this partnership. They credential the teachers (California Designated Subject Teaching Credential), hire the teachers (paying them standard hourly local district rates), develop the curriculum with the teacher, advertise the classes, recruit the students, and provide school credit to program graduates.

Project STEP now trains over 2,000 students a year. STEP is a perfect example of a partnership between business and schools that works successfully. The reason is simple. Both parties benefit from the relationship. Both realize that better training opportunities and more resources are available through this relationship than would be available if the parties did not work together. And both parties are pleased when well-trained graduates are hired by the bank and other financial institutions upon completion of the classes. In Project STEP, everyone wins: students, ROPs, local

schools, communities, Security Pacific Bank, and the financial industry in general.

Corporate Needs

There are numerous success stories such as this around the country, but not enough to make a significant difference in the overall quality of education and student graduates.

Today corporations are speaking out louder than ever about their need for qualified job applicants who have good basic skills, entry-level job skills, and good work attitudes. The strength of America's position in the international economy depends upon satisfying this essential need.

If schools continue to turn out inadequately prepared graduates, business has several choices: (1) do the training itself; (2) paticipate as an active partner in the training; (3) become more involved in collaborative efforts between business and the schools; or (4) provide increased financial aid to schools.

If things do not improve fast, many large corporations will have to teach new hires both basic and vocational skills. Some companies already do.

The high demand for qualified job applicants has raised the interest level of many companies in the potential benefits of business/education collaboration or joint training. However, business will have to see immediate rewards from its efforts for collaboration to be meaningful.

Although conditions may point to business providing increased financial aid to schools, this alternative is least likely because of the economy and the fact that it is not good business to back organizations that have poor track records. The findings of several recent and well publicized national education studies speak for themselves. Schools need to improve.

THE TEN MISSES

Naturally, the most desirable option is for schools to produce a quality product, with business involved in that process. So where do we go from here? The barriers to education/industry collaboration can easily be understood and ideal working relationships conceptualized by biting the bullet and analyzing the ten deadly misses.

Mistrust

The first serious problem arises when representatives from business and education get together to explore possible collaborative efforts, because neither really trusts the other's motives. Most often, school representatives stare at business people with dollar signs in their eyes. Many school people believe that business cannot possibly know the realities of education's

problems and that if business would just hand over the dollars and get lost "collaboration" would be perfect.

Business, on the other hand, usually thinks that any school-related project will take far too much money and staff time; that the educators are probably going to be unprofessional and unaware of and unsympathetic to business's problems; and that schools probably just want money. Period.

If any meaningful experience is to occur between business and school representatives, they must first recognize the other party's mistrust, bring concerns and feelings out on the table—and begin to educate one another about their problems, challenges, concerns, and bureaucratic red tape.

The parties will soon learn that they have much in common, experience numerous mutual problems, and can help each other work toward their goals.

Misunderstanding

Misunderstanding occurs for many reasons. First of all, school and business people speak different languages. Phrases such as "affective domain" and "bottom line" can cloud clear communication. When business and school people talk to one another about collaboration, it is best to eliminate jargon.

Another level of misunderstanding occurs when parties do not have an accurate understanding of what is expected of them: roles, commitments, resources, budget, duties. Business/school collaboration of any kind must have clearly defined goals and objectives, preferably in writing. People must understand what they are being asked to do. Desired results, benefits, and rewards must be determined early.

People arrive at a level of understanding by being honest and open about their expectations and needs. Collaboration requires that both school and business people understand that everyone wants to win and benefit from the relationship. Everyone.

A major roadblock to understanding is red tape and approvals, on both sides. It is very important for school people to realize and respect how hard it is for business to participate in education programs. These programs must be "sold" to business in a professional manner. The challenge is to find a person within the company who has the interest and power to enact the program. Unless it is a chief executive officer (CEO in business talk), few individuals have the authority to commit a company to a school program. That business person will have to do a lot of internal selling, often taking the proposal up several levels to the top, before a company can become involved in a major joint effort.

Good sales people anticipate and prepare for negatives. Businesses that have never before worked with schools are afraid of all the things that can

go wrong: liability, budget, time, and cost. These obstacles must be overcome by talented sales people from education and business who have already thought out well-planned responses to business people's concerns.

For these reasons, it is essential that education respect the effort required for business's participation and, therefore, follow through on any program or project they propose to business.

Misestimation

Underestimating the amount of staff, time, or dollars a project will require can cause frustration, worry, and anger. Such problems can get people in trouble in their own houses and create ill will outside.

It is essential that any school/business project be accurately analyzed and planned so that there are no suprises. Because school/business relationships are very fragile, they should be treated gently and with concern. If any major misestimation occurs, the problem should be discussed as soon as it is detected and a solution mutually developed. Getting over these touchy and often embarrassing hurdles is essential to future working relationships.

Mismanagement

In school/business relationships, there is no room for sloppiness. Such projects may not be high priority items for either party, but they should be. As any professional knows, the only way to get desired results is to make sure that every detail is well mananged.

From the business point of view, dollars are as hard to come by as education dollars, something educators must understand. If business gets burned because its resources were not well used or were wasted, there may not be a second chance.

It is equally possible that joint projects can be mismanaged by business. Often a relatively inexperienced person is given the responsibility of coordinating these types of projects. If problems arise because the individual is not qualified, school leadership should "finesse" the situation and try to have a more qualified person assigned to the project.

People involved in school/business projects must have, or quickly develop, good skills in working with people. In addition to managing tasks and details, people must be managed and kept happy. Such is life in the big city, and school/business ventures are definitely big time because they have often been blessed by both school's and business's top management.

Mistreatment

This "miss" should be a simple one to avoid. The requirements are good manners, empathy, and respect. Courtesy is good business. There is noth-

ing as infuriating as someone who will not return a phone call. This type of discourtesy can be the beginning of the end for business/school collaboration.

Misusage

Since business and school resources are precious, they should never be misused. For many teachers, an outside speaker simply means time to correct papers or leave the classroom. When this occurs, that speaker is generally being misused—or plain used.

Another common misuse of business resources is the famous advisory committee. Often schools simply need these committees to rubber stamp their programs to prove they have met a funding requirement. Business people soon catch on to this game and do not continue to volunteer their time unless the committees make a valuable contribution.

There is not enough time in the day for anyone's talents or resources to be unthoughtfully or wastefully used.

Mistakes

Mistakes happen. The goal is to prevent as many as possible. A simple mistake which involves a school/business relationship could prevent future collaboration, unless the relationship has a sound foundation based upon mutual respect and concern.

Mismatches

Mismatches also happen but, unfortunately, it usually takes a long time and lots of frustration to discover that such has occurred. A perfect example of a mismatch would be an adopt-a-school program where the wrong school is matched with the wrong company. For any number of reasons, both parties usually learn the hard way that they were not made for each other.

There is no simple rule to avoid mismatching. A careful evaluation of the interests and needs of the proposed parties must occur to see if bringing them together will produce the desired results.

Misvalue

Good common sense tells us never to assume anything. And an intangible and subjective thing such as "value" can be easily misjudged. For a school/business relationship to work and produce meaningful results, both parties must equally value the relationship, its purpose, and its goals. As in marriage, when one party cares more than the other, the marriage usually goes on the rocks. And, as in marriage, when this happens in school/business relationships, the children suffer.

Miscarriage

"Miscarriage" is a rather colorful word to describe an unsuccessful venture between schools and business. Such failure could involve a small project, an experience, an enormous undertaking such as massive job skills training, or simply personalities.

Any miscarriage is a painful experience, and pain is to be avoided. After a school/business miscarriage, the underlying reason for the relationship had better be important to all. Now is the time when that clear commitment to the belief that working together will be far more beneficial to all concerned than working separately must be firmly in place. For without such a commitment, the relationship will be terminated.

CONCLUSION

Commitment is the key. The future of a strong educational system with business and industry involvement depends upon people believing in this concept. Without dedicated firm believers from school and business working toward this goal, the future will probably see a role reversal, with businesses becoming schools. And where will that leave education?

Educational Institutions Must Welcome Collaboration

Don C. Garrison

A tidal wave is rolling across the social, economic, and technological structures of the world, crushing the old ways of doing things at home, at work, and at play.

In its wake lie destruction of values, the way we spend our leisure time, and old work stations. In their place, dynamic nations are erecting a new social order that recognizes a global economy and a technology that are not restricted by political boundaries. Here, in the United States, where one of every 10 workers is unemployed and where old jobs are vanishing daily, we are beginning to rebuild on the solid foundation of new technology and a revitalized economy.

Industries are clamoring to retool; employees are clamoring to retrain; and developers are clamoring to bring the benefits of all of this clamoring to their areas.

These factors are reshaping the role of higher education, especially postsecondary occupational education, in the communities of America. For instance, Detroit's shift from large cars to compacts and subcompacts is complicated further by the introduction of on-board computers in automobiles. In much of the textile industry, waterjet looms, computers, and robots demand the training of technicians who, in many cases, have never heard of these machines.

"One of our biggest tasks is keeping our salesmen trained on the latest products of our company. By the time one product is introduced, we have one that is more technically advanced already off the drawing boards," said an executive of one of the country's leading electronics firms. This comment summarizes the findings of a group of technical college educators from South Carolina who visited leading industries in the country to determine the types of training programs the firms will need during the eighties.

These visits clearly demonstrate that postsecondary occupational education is being challenged by industry to keep pace. At one firm, we were told, "We know that you can't keep up with us. The best you can hope for is 'fast follow.'"

TRAINING PROGRAMS ATTRACT JOBS

The most successful educational programs in the eighties will be those that follow the fastest. Programs and states that lag can expect educational and economic stagnation. But don't sniff for stagnant winds from too many states. Most states are beefing up their abilities to train for "super tech" industries because they know that training programs attract capital-intensive technological firms.

As industrial recruitment has intensified among the states in recent years, collaboration between education and the private sector has moved to the forefront as a magnet for lucrative jobs. Industries often say they create new jobs in a given college's service area because of the technical training programs there.

A fact sheet published by the American Association of Community and Junior Colleges (AACJC) states, "Several community and junior colleges have studied their economic impact on surrounding communities. One such study on the state level indicated that the total economic benefits received by the state far exceeded the tax fund appropriations for the community college system."

When Pratt and Whitney Aircraft opened a plant in Maine, the company's payroll was $17 million. At the same time, Pratt and Whitney spent another $17 million for supplies and services from other firms in Maine.

Even greater benefits to the people of Maine were pointed out by Thomas H. Cryer, manager of personnel relations for the aircraft group. He told community college educators at the annual seminar of AACJC's Council for Occupational Education, "Approximately 1,000 individuals are acquiring industrial skills which may be used throughout the labor market in future years."

Cryer's comments reinforced an earlier statement by Maine Governor Joseph E. Brennan, "I do believe that jobs will do more to solve our social problems than a host of social programs."

A growing awareness by developers and educators punctuates the fact that we are partners in a highly competitive market. From California to Maine, every area of the country is jockeying for capital-intensive, super-tech industries. State after state is selling the liaison between industry and education as a prime reason for a lucrative firm to locate in a particular college's service area.

MORE THAN COSMETIC RELATIONSHIPS

The liaison between development and education cannot be cosmetic only. Industrial developers are now stepping behind the facades of partnerships and looking at the intricacies of such claims. They are going into class-

rooms and laboratories and talking with instructors and students. They are talking with other industrial leaders in the community to determine the degree of cooperation between the college and the employers of graduates. And they are examining initial and continuing relationships between colleges and industries. No longer can a college expect to do only those things that *attract* economic development to a community, but it must do those things that *keep* employers in the community.

Requirements for a Successful Program

In a policy statement a couple of years ago, the American Vocational Association discussed what I call the beatitudes of a successful economic development program for a community technical college:

- Be flexible. Be prepared to train workers in skills that are not presently required in your community.
- Be realistic. Demonstrate clearly, concisely, and honestly how you can respond to the training needs of a specific employer.
- Be strong programmatically. Innovative degree and continuing education programs that respond to local needs are imperative.
- Be strong physically. Have equipment, laboratories, shops, and other facilities that attract the employers desired by your service area.
- Be involved. Involvement in community activities demonstrates to a prospect that you are part of the community.
- Be open. Encourage representatives of the prospective firm to view your labs and classrooms and to discuss their specific training needs with you and your staff.

The competition for economic generators is keen and will intensify. This, however, does not portend doom for active, vibrant, involved community/technical colleges which work daily with their local employers. On the contrary, the competition serves as a stimulus to colleges sincerely interested in collaborating with the users of their products.

High Technology Is Costly

Cost, that driving and halting force in our economy, necessarily skews the collaboration between educators and the private sector. In this metamorphic era when technology scores quantum leaps almost daily, educators and business and industrial leaders make decisions every day that are based solely on economics. "Will a production line robot or a CNC milling machine do this job cheaper?" asks the industrialist. "Can we afford to emulate that process?" asks the educator.

Herein lies the crucial basis for collaboration between the private sector and education. Working together, we can buffer the economic shock of

embracing new technology in the private sector and on campuses around the nation. What good is a robot on the production line if no one can program it, and what good are robot programmers if there are no robots in the community?

Advancing technology and cost effectiveness reinforce the need for educators to strengthen their ties with the private sector. We will have more relevant, more responsive programs as a result of this stronger relationship.

STRENGTHENING THE TIES

For far too long, advisory committees have been mere window dressing and community needs surveys have produced neat little documents that are shelved, upon publication, never to be removed.

As educators interested in initiating and nurturing collaboration with the private sector, our first order of business is to ensure that we have de facto advisory committees. I know of a college where an advisor had been dead for more than a year, yet he continued to be listed as an advisor to a business technology program.

Some colleges allow their committees to be run by second choices. Never accept less than the very best person. If your choice is the plant engineer, refuse the assistant plant engineer. You want the top decision maker, one who can contribute the most toward shaping your program to meet *local* needs.

Use your advisory committees. Encourage their involvement. Be sure that committee meetings are more than several verbal reports by the department head. Seek information from them. They possess a wealth of essential information that you must have pertaining to new technology, equipment, t[illegible]books, job requirements, and costs.

Formal and informal surveys, like advisory committees, must be used to be effective. However, an excellent needs survey completed today may not be worth its paper two years from now.

Industrial Needs Change

At Tri-County Technical College, Pendleton, South Carolina, we surveyed area firms in 1978 on the need for computer programmers and found that sufficient jobs did not exist locally for the college to institute a curriculum. Three years later, another survey identified a pressing need for computer programmers.

When the South Carolina Technical Education College System launched Design for the Eighties (discussed later in this chapter), representatives of existing industries spoke first, at a series of listening sessions at the 16

technical colleges around the state. These employers of technical graduates were spending and continue to spend millions of dollars a year to retool in the high technologies. They told us their needs then and their projected needs for technicians; thus, vanishing occupations began to unfold to us. Partly because of those disappearing occupations and partly because of the economy, we have closed five programs and opened two new ones at Tri-County in the past three years. Other colleges have taken similar action.

Additionally, the listening sessions alerted us to the need for continuing education courses dealing with everything from industrial electricity to management principles.

Since we included area superintendents of education in the listening sessions, several recommendations surfaced from their peer-group meeting. Subsequently, we hosted inservice training for the faculties of the various districts, giving them an opportunity to see first-hand the college's facilities and programs.

Listening sessions, which are essentially surveys, establish or improve rapport between educators and between educators and the private sector. I cannot overstate their value as we explore ways to fuse the levels of education and the world of education with the world of work. The challenge, ultimately, is to erase the lines of division and produce an environment where all levels of education and all elements of the private sector function as a single unit, working toward a common goal.

Collaboration from the Beginning

Vocational education has always enjoyed a close relationship with the private sector. Perhaps we have rested too long on this relationship when we should be the activists for increased collaboration with private enterprise.

President Ronald Reagan articulated the challenge to a group of young business leaders in February 1983, when he said, "High technology is revolutionizing our industries, renewing our economy, and promising new hope and opportunity in the years ahead. You, the captains of industry and commerce, as we in government, share the responsibility for moving our people and our economics over the threshold."

Pitching for joint ventures involving education and the private sector, he added, "We share an obligation to lift all our people into a new age of prosperity, bringing skills to the untrained and opportunity to those without hope."

Business-as-usual will not produce the sweeping initiative suggested by the President. At the same time, we should not abandon tried and true

methods that can still be used effectively today. Representatives of education, for instance, who assess manpower requirements in business and industry are just as valuable—if not more valuable—today as they were 20 and 30 years ago.

When substantial numbers of jobs requiring new skills are created in a college's service area, that information must be communicated to the appropriate people at the college through the industrial services representative.

Customized training, the hallmark of vocational education and often a result of the industrial representatives's assessments, is another tried and true service of local delivery systems. The incursion of high technology throughout the depth and breadth of the global market place demands stepped-up emphasis on customized training.

Need for New Vitality

Most states offer no-cost training for new and expanding industries, and some are beginning to introduce the same no-cost service to employers who create new jobs through advanced technology. This new dimension to a time-tested, successful program can breathe new life into the relationships between vocational education and the private sector.

The December 1982 issue of the *ASTD National Report* quotes researchers for the W. E. Upjohn Institute for Employment Research as saying, "There's a lack of understanding that a dynamic economy produces both job displacement and job creation." The report illustrated that robots in Michigan will, by 1990, eliminate between 13,500 and 24,000 jobs and, at the same time, create 5,000 to 18,000 jobs. We can see without a crystal ball what such a job twist forecasts for the vocational educators in Michigan. Similar crises are popping up in other states.

This job twist, wherein thousands of people need to learn new skills, could conceivably occur without the opening of a single new plant. It could result from the retooling of existing industries, presenting another challenge for educators and the private sector to get their acts together.

Through revitalized, customized training, victims of the skill twist can retrain and employers can have the technicians they need for the eighties, nineties, and beyond. Keeping costs to a minimum or free to the employer will buttress the entrepreneur's position in an international marketplace which is heavily influenced by high-tech production processes and low-cost labor.

Continuing Education Can Help

Unquestionably, partnerships with industry can be vocational education's

most effective, direct way of providing relevant continuing education programs.

The industrial representative, the continuing education staff, and an employer working together constitute an excellent mechanism for the implementation of customized, short-term training. Here, again, casualties of the skill twist promulgated by advancing technology can learn new skills and be back on a payroll with a minimum investment of time.

We have learned in the past couple of years that many of those who have lost jobs to advancing technology are people who have excellent work records extending over the past two or three decades. These people want and need work to support families, and they cannot invest a year or two to retrain.

Continuing education departments, in my opinion, inherit a moral and ethical obligation to reach out to these people and provide bootstrap programs that will return them to productivity. Who can design and implement such an initiative without the aid of the private sector?

Training people, even in a short-term continuing education program, for jobs that do not exist is a travesty. As we do in curricular programs, we must involve employers in all phases of planning and implementation of continuing education occupational programs, whether they be for reemployment training or upgrading.

THE EIGHTIES AND BEYOND

Though some of the business-as-usual techniques can be adapted to the technology of the eighties and nineties, educational institutions at all levels now face the same tough, make-or-break decisions that businesses and industries have faced in recent years. Those firms that have embraced new technology have flourished, while those that have wallowed in indecision have failed. Occupational educators can expect the same fortune or demise.

The technology for today and the future cannot be bought at the discount store. Computers, electronic device, robots, CNC machines, and most state-of-the-art hardware are expensive. Yet, occupational education mandates this kind of costly equipment if colleges and schools are to provide relevant training.

Quoting from a study of the Education Commission of the United States, NBC correspondent Lloyd Dobyns told the 1982 National Conference of the American Society for Training and Development, "Unless public education is improved, particularly in teaching students to think and reason, when the two and a half million youngsters graduate (from high school in 1990), two million of them—80 percent—will be unemployable because they will be technologically i literate."

Dobyns pointed out that no one on the public payroll is trying to match technological advancement with industrial needs to predict which areas of training will be needed to prevent technological illiteracy.

This indictment of our national public policy does not, however, extend to the grass-roots level where occupational education and the public sector have worked in concert over the years, with an eye to the future, to meet *local* manpower requirements.

New Methods of Responding to New Needs

In South Carolina, the technical colleges' special schools for new and expanding industries served the state effectively in the sixties and seventies, training around 75,000 specialists for jobs that did not exist then in the state. The program continues to attract industries to South Carolina, but the high tech of the eighties calls for initiatives to produce technicians with skills in microelectronics, robotics, computer programming, and other emerging technologies.

By special appropriation, Governor Richard Riley and the South Carolina General Assembly established six centers for innovation at technical colleges around the state. They provide state-of-the-art training statewide to technical faculty and students and to people in business and industry in microelectronics, robotics, office occupations, machine tooling, computer programming, and water quality. Each center is equipped with the latest devices on the market. After less than a year of operation, the centers have attracted thousands of students and technical faculty to seminars, equipment displays, and customized training programs.

Two mobile units displaying equipment from the centers have attracted hundreds more technical faculty, students, and industrial specialists. These units are used for hands-on training where the required equipment is too expensive to place in each of the state's 16 technical colleges or the six centers.

The centers are bringing national leaders into the state to conduct the seminars, lectures, demonstrations, and other programs.

South Carolina instituted the centers for innovation after a thorough investigation revealed that many of the industries in the state were retooling with high-tech equipment. The State Development Board requested the centers in order to help attract high-tech industries to the state.

Battling the Test Score Decline

Other states are moving ahead similarly; governors in many states are requesting set-asides for programs to attract high-tech jobs. Also, attention is turning to the full spectrum of education as a means of lifting America's technological literacy to keep the nation in a position of leadership in the

world market. The deteriorating performance of high school students on Scholastic Aptitude Tests administered between 1970 and 1981 concerns educators and those in the private sector who must be on the cutting edge of technology to remain competitive with countries where cheap labor abounds. Between 1970 and 1981, verbal scores declined 36 points and math scores dropped 22 points.

A report of the National Science Foundation gives these reasons for the declines:

- Few high school teachers have had formal preparation to give students an understanding of modern technology.
- High school teachers have few opportunities to update their skills.
- Generally, precollege instruction in science, mathematics, and technology has not taken advantage of the advances in instructional technology and behavioral sciences of the past 20 years.
- There is evidence that many students who are interested in science, mathematics, and technology are not being reached by present classroom practices, although they are attracted to these subjects by what they see on television and at museums, planetariums, nature centers, and national parks.

CONCLUSION

If America is to maintain her position as a major industrial power in the global marketplace, all levels of education and all types of business and industry must maximize the use of cutting-edge technology. When new equipment and processes are introduced, they will have to be applied without delay because the technological race is galloping ahead unrestrained. Educational institutions and private firms that fail to put into practical use the state-of-the-art technology available to them will be left behind.

As a nation, we cannot afford to be left behind. Delays in the development and implementation of new technology can bankrupt us while other nations, such as Japan and West Germany, march ahead in the parade of advancing technology.

Revitalized emphasis on mathematics and the sciences and increased emphasis at all levels of education on the use of the technology already available can rescue us from certain denigration in the world market.

We should assess our present collaboration with the private sector, determine those programs that are most successful, and present them as models. We should begin immediately to explore creative ways to link the classroom and laboratory with the work station. Finally, the expensive process of applying high technology, as successful industries do, can lift

the technological literacy of the nation, which must now depend upon technology to keep its share of the world market.

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Governance: A Help or Hindrance?

William Payne and B. Lamont Carter

During this period of economic downturn and accompanying unemployment, the governance structures of institutions that deliver job training are receiving close scrutiny. In a recent survey of state legislatures conducted by the Education Commission of the States, representatives of 17 states identified postsecondary governance and structure as a forthcoming issue for study. Thirteen state representatives selected vocational education, employment related training, and the relationship between vocational education, community colleges, and other programs as a pertinent issue.

The governance of multiple state activities related to vocational, technical and postsecondary occupational programs is a key or emerging issue in as many as one-half of our states. Why? There are numerous reasons for this growing concern, some of them peculiar to the individual states, and some common to all states. The reasons generally regarded as common to a large number of our states include but are not limited to: (1) the awareness by state political leaders that education and economic development must go hand-in-hand, particularly in the area of high-technology development; (2) the continuing frustration experienced by business and industry over the lack of flexibility and responsiveness needed to strengthen the nation's work force, on the part of educational traditionalists; (3) the enactment of the Job Training Partnership Act, which mandates that states reconsider the structure used to implement employment and training programs; and (4) tax shortfalls and other fiscal conditions which demand the elimination of continued duplications and related "territorial battles" among the various state agencies and institutions.

THE NEED FOR COORDINATION

Program duplication is an area of increased concern although many postsecondary vocational-technical administrators would prefer not to discuss it. In the past two decades many states employed separate governance systems for vocational-technical institutes, community colleges, and area vocational schools (some of which were tied to high school programs). Several states offered postsecondary occupational training programs

through their state university system or systems. One could easily identify several kinds of state-supported institutions in the same region of a state offering the same kinds of programs to young and old.

Coordination of training programs offered by a variety of institutions becomes increasingly difficult because of fragmented governing structures and special interest groups. In many states, vocational-technical institutes and area schools are under the state board of education (usually K–12). Community colleges and other subbacalaureate programs in these states are under one or more separate governing boards in the state postsecondary system. As a result, vocational educators remain concerned over their positioning in the state educational hierarchy. The concern is based almost exclusively on the feeling that traditional academic programs, offered elsewhere in the complex governance structure, will receive first priority.

With these and other factors in mind, several states are considering some of the following options: (1) upgrading vocational-technical education by having the commissioner or director responsible report directly to a vocational-technical education board; (2) where none exists, creating a separate state board of vocational-technical education; (3) mandating coordination; (4) consolidating the governance of all community colleges and technical institutes, area vocational schools, and state industrial training services under a new state board; (5) merging community colleges and technical institutes in the same geographical area; and (6) creating stronger advisory bodies involving business, industry, labor, and education, with the authority to coordinate programs and allocate resources.

The national decline of heavy industry in certain areas and the rapid growth of high-technology-related industries tests the spontaneity and the adaptability existing in state and local governance. These conditions in today's rapidly changing society call for improved planning and coordination to meet the demands of a changing job picture and of a concerned public. The dilemma facing planners who are responsible for evaluating and improving the present systems usually includes the desire to retain the operational flexibility to meet local needs balanced against a coordinated statewide thrust designed to reduce costly duplication. This problem is compounded by traditional resistance to change and "protection of turf." The challenge of supplying present and future work force needs plus the ability to attract new business and industry should be paramount factors in planning for constructive change.

The Federal Role

The evaluation of the federal contribution to vocational-technical governance depends on the definition of the appropriate role of the federal government. In addition to providing funding with implementation

guidelines, the role of leadership and general direction seems to be well accepted. In establishing a national direction for vocational education, the importance of general beliefs such as the preparation for work as a valid educational function, the emphasis on equity in terms of access and quality, the strengthening of the economy through a well trained labor force, and the ability to provide upgrading and retraining are well documented. The role of the federal government has been delineated as one of stimulation, equalization and improvement and concentrating financial resources on the areas of greatest need. The states are left to determine their own needs. The current sole state agency concept mandates that the administrative responsibility for vocational-technical education governance be vested in one governing board.

THE VARIETIES OF GOVERNANCE

A recent study by Don K. Gentry identified the different types of vocational-technical governance structures used by states which supposedly adhere to the sole state concept called for in federal regulations. The study identified the following four basic types of governance:

1. Type A: states with one agency for all levels of education (six states).
2. Type B: states with an agency for elementary and secondary schools, including vocational education, and a state coordinating board and/or governing board for higher education (30 states).
3. Type C: states with an agency for elementary and secondary schools, an agency for vocational education, and a state coordinating or governing agency for higher education (nine states).
4. Type D: states with an agency for elementary and secondary schools, including vocational and technical education, and governing boards for individual institutions of higher education but no statewide governing agency (three states).

Two of the 50 states did not fit into the four general categories identified by the study, but 62 percent of the states have a governing agency for secondary schools, including vocational education, and a coordinating/governing agency for higher education.

Complications

When the sole state agency has been identified or created at the secondary level, the coordination of programs and the allocation of funds between secondary and postsecondary programs becomes a formidable task. To further complicate the situation, the governance of the vocational-technical institutions in some states is divided between two boards. In Tennessee,

for example, the primarily postsecondary area vocational-technical schools and the technical institutes were governed by the State Board for Vocational Education. The vocationally oriented community colleges were governed by the State Board of Regents. The State Board for Vocational Education is the sole state agency responsible for allocating federal funds to the respective institutions and programs.

The power reserved for the states by the Tenth Amendment of the United States Constitution has contributed to the diversity of state educational governance structures. With limited federal direction, state government officials established configurations to fit the pressures of state needs, resources, and political realities. These various considerations, and differing state educational goals and priorities, make the specification of a uniform state governance structure impractical.

However, with the tremendous success of state and business partnerships for technology development, such as the Research Triangle in North Carolina, the attempt to recruit and develop high-technology industries is commonplace among the states. The obvious consequence of these activities is the examination of the responsiveness and the suitability of vocational-technical education. As documented earlier in this chapter, the postsecondary vocational-technical governance structure is receiving close scrutiny in many states.

THE TENNESSEE STUDY

An interesting case in point exists in Tennessee, where a major revision in educational governance recently occurred. This action passed by the General Assembly and signed into law by Governor Lamar Alexander followed years of study and debate. The 92nd Tennessee General Assembly adopted a resolution that provided for the first legislatively sponsored comprehensive study of public education in 25 years. The resolution spelled out areas to be investigated. A major section of the study examined organizational structure. Its intent was defined as follows: "To ensure the responsiveness and efficiency in the delivery of education services, the overall governance systems were examined." The investigation found that the postsecondary vocational-technical institutions were being governed by two different boards, which made program coordination difficult.

After much study, improvements were recommended for both immediate and long-term action. The desired outcomes of the recommendations included the improvement of postsecondary vocational-technical education coordination, the elimination of unnecessary duplication in the areas of training, and improved responsiveness to rapidly changing educational needs.

The immediate recommendation to help achieve the desired outcomes changed the present governance structure by transferring the 26 area vocational schools and the 4 technical institutes from the authority of the State Board of Education to the State Board of Regents. The action placed all postsecondary nonbaccalaureate granting institutions under one board along with six regional universities. The State Board of Education should be able to give full attention to the education needs of the K–12 program. The long-range recommendation would concentrate the governance of all baccalaureate-granting institutions under one board. The governance of all postsecondary nonbaccalaureate granting institutions would occur under a separate board.

The Job Skills Task Force

While the legislature was conducting its comprehensive study of the state's educational systems, Governor Alexander asked 22 prominent business and industrial leaders from across the state to serve as members of the Job Skills Task Force. These individuals were charged by the governor to use their experience and knowledge to identify potential growth areas in the state. The specific objectives of the task force were to determine from an employer's viewpoint:

- The kinds of jobs that would be available in Tennessee in the next decade and beyond.
- The skills that Tennesseans will need to perform those jobs.

In addition, during the course of this project, a third and particularly important objective was identified by the task force:

- To determine whether Tennessee's training and education delivery systems are responsive to current and projected job skills needs and to recommend appropriate changes to improve those systems.

The task force found that in Tennessee there were a large number of agencies, boards, departments, and commissions which have duplicative responsibilities and authority for the design and delivery of vocational and technical training. The task force suggested that in many cases course offerings were not in tune with changing business requirements. It also stated that there was insufficient responsive interaction between business and educational leadership in the design and delivery of occupational training programs.

A Consolidation of Governance

The task force recommendation that received the most attention dealt exclusively with the governance of postsecondary vocational-technical education. The task force recommended moving the 26 area vocational schools and 4 technical institutes from the State Board of Education (K–12) to the

State Board of Regents, which governs the state's community colleges and regional universities. This recommendation became part of the governor's legislative package on education. Subsequent passage resulted in Tennessee's taking a major step toward addressing the concerns cited earlier in this chapter. Job skill training in Tennessee, 40 institutions strong, is now under unified management.

This is only one example of substantial education reform which is likely to occur in many states in the near future. Although 1984 would seem to be a time for business as usual, the morass of budget cuts and fiscal freezes apparently has failed to dim our vision of the future. Public support for education appears to be growing again. State leaders now view education as the infrastructure of the information age. It is increasingly apparent that education will pay the central role in the creation of new jobs and the retraining of the unemployed or displaced worker. Governance structures that are streamlined, responsive, and sensitive to job requirements will be the vehicles for fulfilling this role. Governance structures and systems, long viewed as burdensome and a hindrance to public sector-private sector collaboration, are evolving and emerging to enhance this most significant partnership for the benefit of everyone.

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How Employer-Employee Contracts Affect Collaboration: The View from Education

Harold McAninch and Joan Bevelacqua

Business and education partnerships seem to offer a viable mechanism for retraining displaced workers, training a skilled labor force to meet the needs of the nation's businesses, and encouraging economic growth. However, the unique union of these distinctive groups raises a number of issues that colleges need to resolve before entering into such partnerships if they are to avoid problems and disappointments. The authors believe that the issues are centered on and related to employer-employee contracts of both colleges and businesses. These issues must be addressed if colleges and businesses are to collaborate successfully. Colleges that enter into contracts with business can find their efforts grinding to a halt if they have not determined beforehand how to deal with the potential problems and restrictions imposed by labor-management agreements.

FACULTY CONTRACTS

In the governance of postsecondary education the faculty has a great deal of input and sometimes control over curriculum, teaching loads and assignments, hiring and evaluation, salary schedules, and institutional policy. The degree of faculty influence in each of these areas varies with each institution depending upon the union contract, faculty senate strength, and tradition. However, in nearly every institution, this situation harbors some possible impediments to successfully working with business and industry.

Curricular Change

Faculty members are reluctant to change curriculum, and they do not usually do so without a great deal of thought and consideration. If a business or industry wants a course to meet its needs at a plant, it probably is not willing to wait a year or more for the proposed course to clear the typical college curriculum process. Typically, approval of a new course or program at a community college or university requires that the course be proposed by a faculty member and reviewed by the dean and/or committee from the division. The course then may be studied in depth by the

instructional committee or be referred back to the faculty or division before action.

Some faculty union contracts have even more stringent requirements. The 1978–79 contract between the faculty union (AFT unit) and Joliet (Illinois) Junior College stated that "each full-time faculty member within a given department will have the opportunity to voice his approval or objection of departmental curriculum changes in writing on the institutional forms for curriculum change. This shall be done prior to consideration of such changes by the curriculum committee."

Therefore, if one faculty member in a department objects to a proposed course for a local industry, the approval process would experience lengthy delays. The system was never designed to process rapid responses to courses or training to meet the immediate needs of business and industry.

Some colleges address this problem through a curriculum advisory committee composed of representatives from business and education and special project courses. However, most colleges are encumbered by equally complex state approval processes and are still struggling with this issue.

Making Assignments

Other contractual obstacles also limit the institution's ability to react to the needs of business and industry. A typical clause deals with limitation on work load, hours, or school day. Most contracts specify the work load in terms of semester hours (14 to 16) and/or lab hours (18–20). The Joliet Junior College contract, which is fairly typical, specifies that the normal load shall be 15 or 16 semester hours per semester with a maximum contact hour limit of 20. This contract also specifies that "unless otherwise approved by the instructors, regular class loads will be scheduled within a continuous eight (8) hour period except where assignment to evening and Saturday classes is necessary."

Evening and Saturday scheduling would seem to give the administration some flexibility in assigning faculty. However, the contract limits such off-hour assignments to seven low-enrollment programs, which include art and French. The contract of Kellogg Community College, Battle Creek, Michigan, also limits the contractual day to a continuous eight-hour period and it specifically states that any overload assignment is strictly voluntary. The contract at Pima Community College, Tucson, Arizona, goes even further. It says "the daily hours of accountability for instructional faculty member shall be confined to a six and one-half (6½) hour time span unless a more extended schedule is mutually agreed upon." In some ways this time span allows a little more flexibility than the other two because Pima's six and one-half hours do not have to be between 8 a.m. and 5 p.m. as do the others.

These contract examples are typical and illustrate the problem. A contract or agreement that regulates faculty assignment by hours and time span, may make it difficult to find a faculty member to teach a course needed by industry. Some districts have attempted to negotiate more flexibility in faculty assignments. They have achieved some success with new hires but have difficulty changing the contract for older employees. The Kellogg contract, for example, allows the district to hire new employees to work evenings and Saturdays only.

Hiring and Evaluation

Problems can also arise when the faculty contract requires employing someone businesses do not want to hire. Most administrators will readily admit that some faculty members are good in a structured academic environment, teaching traditional college level classes, but would have difficulty with adult learners in nontraditional settings. Some contracts allow full-time faculty the right of first refusal. The most senior member of a department has the opportunity to teach before the job may be offered to anyone else. This type of clause can create a serious problem between education and business if the "undesirable" faculty member demands the right to teach the class.

This problem is compounded by the type of evaluation methods allowable. Business management demands the right to evaluate faculty and fully expects the college to take action if the faculty member is doing an unsatisfactory job. If faculty evaluation is aimed at self-improvement rather than performance, this can create an unresolvable situation under institutional policy. Some colleges have given businesses the right to refuse an instructor, and others hire only part-time professionals in an attempt to circumvent this problem.

Salary

A major institutional contractual element that often hinders business and education collaboration is the salary agreement between the institution and its employees. Most faculty contracts specify a part-time salary rate. A problem can arise when the institution lacks the expertise or faculty to teach the course for business and needs to bring in someone from the outside. Business is frequently looking for state-of-the-art training in new techniques. It is often difficult to attract anyone to teach in these areas at the standard part-time salary rate. Therefore, the institution may need to negotiate a clause in the contract that will allow for flexibility in this important area or consider a salary variance policy for these situations.

Part-time and Temporary Employees

A related issue involves policy or contract limits on part-time assignments and temporary employees. Most colleges define part-time and temporary employees in terms of how many hours they can teach per quarter, semester, or year. At College of DuPage, a part-time faculty member who is employed full-time elsewhere is allowed to teach a maximum of 15 quarter-credit-hours per year. A part-time faculty member who is not employed full-time elsewhere is allowed to teach a maximum of 30 quarter-credit-hours per year.

Colleges usually have contract clauses allowing for the use of temporary clerical employees to offset peak-time loads. However, very few have policies for hiring temporary professional employees except to staff a grant. It is often possible to hire a faculty member to work full-time for the duration of a grant project. When the grant ends, the employee is terminated.

Training contracts with business are generally short-term. They may require one or two full-time instructors with specialized expertise for two weeks to three months, but seldom for a long period of time. A single training contract would place a part-time instructor in violation of a restrictive part-time faculty policy, thus restricting the ability to use a qualified instructor.

Perhaps the best way to meet the needs of a business is to hire a full-time instructor for three or four months. However, this is not an option without a temporary employee policy that allows the hiring of professional staff on a temporary basis. To fulfill contracts for business, colleges need the ability to mobilize appropriate instructional staff quickly and to redeploy or terminate staff with the completion of a contract.

A possible solution may be to consider a contract that provides services for a business as a grant. This approach more readily allows the use of temporary, full-time faculty, and creates the flexibility to bring adequate resources to a project without violating other part-time and temporary employee policies.

Instructional Design

A minor problem that often arises in working with business and industry is how to handle instructional design. Most colleges do not pay faculty to develop a new course or program. That is usually regarded as part of a professional faculty member's job. If, however, a faculty member is asked to spend the considerable time necessary to design a training component for a particular company or industry, some way must be found to compensate that person. A structure will need to be developed and a pay schedule determined and built into the contract with business and industry. This

compensation plan can affect the rest of an institution's program and staff. Will all faculty members who develop courses in the future demand to be paid? Such demands have been known to surface in some institutions after they began to pay for curricular components designed for industry.

Ownership of Materials

Related to this issue is the question of right of ownership of materials developed. Many college contracts or policies give a faculty member part ownership with possible royalties for materials developed. This would seem unacceptable to business, which expects ownerships of materials that it pays to develop. However, the authors have found that most businesses are willing to negotiate on this item. Colleges need to ensure that their internal policies allow for flexibility of negotiation, and that they have secured the right to negotiate for the faculty member.

BUSINESS CONTRACTS

Colleges that deliver educational services to business encounter two types of situations related to employer-employee contracts. One involves a business contract for educational services to provide training benefits negotiated in an employee agreement. The second involves a business contract for educational services that are not covered in an employee agreement. Each situation represents a different set of potential problems.

Training as a Benefit

Where training is a benefit of a union contract or employer-employee agreement, preferential treatment is generally given to those with seniority. The contract also sets policy related to training time, salary, overtime, holidays, vacation, and absenteeism during training. Generally contracts do not address the specific time within which training must take place or evaluation of the students' performance or the training. These contract omissions are potential problems for colleges providing services for the business.

Time Frames

Driven by the need to balance cost, productivity, and other factors, businesses sometimes leave the implementation of training benefits to the last minute. Under pressure to meet contract requirements, they then approach a college for assistance. Frequently business requests a large training program within one to two weeks. Many colleges will attempt to meet the business's time requirements, because they are interested in adding this client to their list. Therefore, they must review training specifications,

hire appropriate staff, resolve the evaluation question, develop or acquire training materials, and begin the program in one to two weeks. There can be no delays or mistakes. The task becomes nearly impossible if the college is handling contract implementation for other businesses at the same time.

Colleges trying to meet this short response time frequently find that they end up with an unsatisfied customer due to the delivery of an inferior product put together in haste. The authors have found that a minimum of 30 days is needed to review the training specifications of the employee contract in question, hire appropriate staff, resolve the evaluation question, develop or acquire training materials, and begin a program. We believe that unless 30 days are available, a polite refusal with an explanation will do more to maintain good business relations than a hastily prepared program which will have potential problems due to lack of adequate lead time.

Evaluating Student and Program Performance

Seniority, a basic tenet of most employee contracts, by its very nature does not address student performance during training. This does not have to be an issue in non-credit programs, but becomes one in credit programs. Colleges are well advised to raise the issue at the outset. Most businesses will have to resolve the issue with the employee bargaining or negotiating agent. This can be a lengthy process. Colleges can greatly facilitate a positive resolution by providing management with a clear, written description of competency-based grading and withdrawal and audit policy. Most employee groups do not object to performance evaluations and grades. They do object to subjective evaluation and curved grades.

Evaluation of the training program and instructor also needs to be addressed before a college enters a contract to deliver educational services for a business. When training is a negotiated benefit, employees expect to have a large voice in evaluating the training program. A negative evaluation is considered a grievance and can find its way into a grievance process, possibly resulting in a management/labor problem.

Because management is paying the bill, it also expects to evaluate the program. A negative evaluation, whether management's or labor's, frequently means "find another deliverer of the service." Evaluation procedures should be worked out with the business prior to the implementation of any program. Care needs to be taken to see that procedures are fairly developed, well thought out, and acceptable and understandable by all parties. The procedures should include ways to take corrective action and to terminate the contract and should be made known to all parties—including the instructor. Every effort should be made to adhere to the agreed upon procedures.

Training as a Management Initiative

Management initiates training programs that are not covered by an employee contract for many reasons. Such training may respond to a need, such as to retrain for new equipment it did not anticipate acquiring; to assist employees who are being displaced by changing technologies; or to develop skills that have become critical to the business.

The employee agreements do not cover the logistics of this type of training. Management often views this training as generosity it is not obligated to provide, and therefore often expects employees to share in the cost. Management may ask employees to attend programs on their own time, seek to use employee tuition reimbursement money to fund such programs, and attempt to select employees for training based on skill level rather than seniority.

The ability of a business to implement such a program successfully seems to depend upon employer-employee relations. Some unions object to add-on training and particularly any training that skirts seniority in any way. Other employee groups accept management's view that they are being offered an opportunity and will cooperate with management to work out a plan that benefits everyone.

The college that works in this environment needs to be aware of the employee-employer agreement in effect and how far management's proposed program deviates from the agreement. However, it is not the college's job to resolve any problems the proposal may create between the two groups. Colleges should take care not to become involved in the role of the mediator.

To implement a training program, colleges need to know content, time, date, location, type of student, and evaluation methods. Colleges can remain flexible on these items and possibly share with management some ways other businesses have resolved issues such as overtime versus own time versus worktime, grading, and seniority versus skill competency. To become an arbitrator threatens the college's position as a service agency and makes it vulnerable to being the party at fault when labor and management disagree.

FURTHERING COLLABORATION

Mechanisms can and must be established that address contractual obstacles to collaboration and that allow an institution to offer services for business and industry. A number of these issues can be addressed through organizational structure, policy and procedure, and role definition.

Organizational Strategies

The institution can structure its system for delivering instruction to business and industry to get around some of the problems. Some institutions have established separate units within the college to deliver training to business and industry. These separate units usually have the flexibility to respond to industry's needs on an immediate basis without being limited by the other internal structure of the institution.

There are usually some built-in safeguards to ensure that academic quality is maintained in college credit courses. Such quality mechanisms should be put in place very carefully. However, for specific job training, the separate unit should have the freedom to design what is needed when it is needed. It should be accountable only for these programs to top administration and the board of trustees. The unit must be able to be flexible in curriculum design, hiring, and financial arrangements. Such flexibility is absolutely necessary if the unit is to relate effectively to the diverse needs of business and industry.

Other colleges have been able to negotiate the necessary flexibility with their faculties and without establishing separate delivery units. This approach can work, but is often more difficult within the context of a long-standing bargaining arrangement. In either instance, if business and industry are to be served by educational institutions, the institution must structure itself to gain the necessary flexibility to deliver the training rapidly and at the place of business, if necessary.

Policy, Procedure, Role Definition

To work successfully with business, colleges need to understand business and how business works. Understanding employer-employee contracts and agreements is a part of that. Awareness, tactful and accurate information, clearly defined college policies and procedures, and an understanding of the client will allow colleges to work with management to design and implement training programs without getting in the middle of possible labor-management problems. Policy and procedure decisions made early will provide college representatives with the framework in which they can work, ensure educational integrity, and avoid possible problems involving employer-employee agreements.

SECTION III

Varieties of Collaborative Programs

To varying degrees, collaboration has always played a part in educational/industrial development. In this section, Paul V. Braden provides a background for the discussion of collaborative programs by detailing the historical relationship between economic development and the work force and by highlighting the implications of this relationship for present collaborative efforts.

John C. Graves presents a challenging model undertaken by government, education, and industry in Colorado to help solve that state's industrial development and employment problems.

Kenneth R. Edwards and Theresa M. Carroll look at the issues surrounding collaboration among industry, organized labor, and vocational education in providing training of new workers and retraining of displaced workers at the journeyman level.

Robert W. Glover discusses education/industry collaboration as one way to increase the effectiveness of apprentice programs and extend their reach into the educational environment.

These four articles and the case studies they present provide a convincing argument for the need for increased interaction among industry, education, and the community in establishing mutually determined objectives and providing a resource base for the solution of industrial development and employment problems.

Lillian Bates

The Economic Development Role of Vocational Education

Paul V. Braden

Improved coordination of economic development and training has substantial economic benefits for individuals, business firms, and the nation. Coordination is necessary both for those who are concerned about training (vocational education) and those who need a trained work force (business and industry). To reap the benefits, key individuals and organizations in the public and private sector must be involved in decision making, planning, and implementation.

Generally, training institutions and business firms prefer autonomy and will interact with each other when they believe that direct benefits will result. Therefore, the involvement of representatives of vocational education and business firms in economic development depends on the clear recognition of mutual benefits.

LABOR SUPPLY AFFECTS GROWTH

Labor supply is one important factor which affects state economic growth. In a rapidly growing state economy, the supply of labor may be insufficient to meet increasing industrial demand. When there is not enough labor to meet demand, the ability of the local economy to expand will be constrained. This results in unfilled employment opportunities and rising wage rates. The problem can be viewed either as an inadequate supply of labor, or an excess demand for labor resulting from rapid economic growth.

The supply-demand imbalance may be redressed through importation of labor from outside the area, or through moderating the rate of economic growth. Importing labor may generate social costs such as congestion, socially inefficient land use, rising consumer prices, and the overburdening of public services. In this instance, policymakers may define the rate of growth as the primary problem, and other alternatives may be sought. Rising wage rates are a consequence of the labor supply-demand imbalance and can be the focus of market adjustments. However, to identify short-term wage movements as the problem and then intervening in the market

adjustment process may result in reinforcing or embedding the imbalance in the economy.

The educational system, however, affects the supply of labor by altering the occupational mix or the economic character of the state. It can be used as a tool for economic development by increasing labor supply through training people to cope with the new technology or to replace obsolete skills.

Matching Labor Supply with Demand

Some state economies have an adequate rate of economic growth. They can generate enough jobs to absorb the available labor pool. However, the economies may have a serious mismatch between the occupational requirements of the industrial growth sectors and the skills available in the labor pool. This situation recently has become the primary focus of job training policies.

The problem can be viewed in two ways: (1) that industries in some states generate the wrong jobs to meet the needs of the state labor force, or (2) that the state labor force lacks the occupational skills to meet the labor requirements of the industries within the state.

Traditionally, state job training policies have been based on the assumption that the labor force lacks the skills needed by industry. Therefore, training programs have been designed to alter and upgrade the skill of present and future labor force participants to meet present and projected skill needs of industry. Vocational education and other training efforts have offered these programs. For these efforts to be effective, information on labor demand must be made available.

The other approach to matching labor supply to demand would be to influence the local industrial mix so that future employment opportunities more closely match existing labor skills. The ability to affect this mix is somewhat limited in most regions. Most mismatches occur because many members of the work force are either unskilled or their skills are obsolete or inappropriate to the technologies of progressive industries.

ROLE OF VOCATIONAL EDUCATION

A major purpose of vocational education is to help individuals acquire and develop skills needed for jobs in the local market place. Early support for vocational education was geared to specific occupations which were in demand by employers. The assumption was that vocational education benefited both the individual and society by supplying skilled workers to employers.

Vocational Education's Impact: Two Views

Despite the lack of detailed empirical evidence, some economists believe that the occupational job structure is sensitive to changes in the supply of trained or trainable workers. For example, Michael L. Wachter has maintained that the supply of trained workers would likely influence the volume of "good jobs" forthcoming from employers. This finding is partially borne out by the examples of recent industrial activity in the Southern states. Many firms that have recently located in the South cite the availability of a highly skilled labor force as one of the major factors influencing their decision. Other economists, such as Lester Thurow, argue that the structure of jobs is quite independent of the educational and training characteristics of the labor force.

It could be argued that vocational education or training alone will not result in the economic development of a state. There is some evidence, however, that capital and labor both move in the same direction. This means that, with some exception, states with high returns to labor also have high returns to capital in the short run. Such a situation implies a greater role for vocational education and other training programs in state economic development.

Many states and localities offer a range of financial incentives to attract new industries or to encourage existing ones to expand. The incentives include tax exemptions or city or county revenue bonds to aid the industries. However, competition is now increasing through ensuring industries a supply of trained manpower. Vocational education is part of this competition either through the direct delivery of services or through offering the use of vocational education facilities such as schools, machine shops, and labs for the training.

EXAMPLES OF COORDINATION

The role and linkage forged between vocational education and economic development is best illustrated by some state and local contributions of vocational education and training to new industry efforts. The following examples were selected from a large number of state and local programs where vocational education and economic developers work together for economic development in their respective areas.

Oklahoma

The Oklahoma Department of Vocational and Technical Education provides economic development assistance to the state in cooperation with the Division of Special Schools for Industry Training. The department

reinforces economic development efforts in the state by explaining to prospective industries the training that is available. The department maintains two industrial coordinators in the Oklahoma Department of Economic Development to serve as a liaison with industry. In this way, the Department of Vocational and Technical Education can put together programs that meet the specific needs of new or expanding industries.

Battle Creek, Michigan

Economic development in Battle Creek is served by a master plan developed under the leadership of the Calhoun Area Vocational Center. The plan is designed to provide a coordinated training program to business and industry through one coordinated source. Working together under the plan are the vocational center, the Michigan Department of Labor, the Calhoun County Employment and Training Administration, and the Michigan Employment Security Commission. These and other agencies and organizations joined in the Council for Employment Needs and Training. The council offers an opportunity to representatives of business and industry, labor, education, and service agencies to discuss the employment and training needs of the area. In this way, training and apprenticeship programs can be put together to serve specific needs of local companies.

VOCATIONAL EDUCATION AND PRODUCTIVITY

Productivity of the work force is an area of important economic activity. The effects of education on productivity are difficult to measure accurately. Most studies of the effects of education on productivity have suffered from limitations that include lack of adequate data, inadequate measures, and the weighting of factors. In effect, a system has not been devised that can measure accurately and directly the impact of education on the economic growth rate.

However, it is known that human capital and its deployment does affect economic growth. Rational policy decisions can be made in the future to change the distribution of the productive abilities of labor. Since productivity involves workers, their capabilities, their value systems, their sensitivities, and their aspirations, vocational education, through training and retraining programs and through guidance and consulting services, should be in a good position to affect the productivity of our labor force.

The labor force is a potentially rich source of economic development that could be altered and improved through education and training.

The average American worker, with over 12 years of schooling, is one of the best educated in the world. There is some argument, in fact, that the work force is overeducated.

A recent Bureau of Labor Statistics study reports that between 1976 and 1985 there will be 2.7 million college graduates who will be forced into below college-level positions. There will be 10.4 million graduates competing for 7.7 million jobs traditionally requiring college degrees. Any future educational policy should be directed toward targeting education to the realities of the job market.

By improving the training level of the work force and by providing a variety of flexible opportunities for retraining, public and private vocational education institutions can play a significant role in increasing the productivity level of American labor.

CONCLUSIONS

A well-coordinated economic development effort at the local or state level includes adequate training facilities and programs geared to specific needs of employers. In southern states, industrial training programs conducted by vocational institutions have demonstrated the potential for attracting new and expanding industries. In many states, for example, Oklahoma and South Carolina, the relationship between industrial developers and vocational educators has resulted in economic expansion. Similar efforts are under way in other states.

Improving the productivity of American workers is becoming important for our economic survival. Vocational education, by improving training programs and by providing training to marginally productive workers, could make a difference in the productivity level of the work force.

One important objective of economic development is more jobs. Training alone will not result in increased employment. Vocational educators need to assess employer needs which translate directly into employment opportunities. Vocational education thus has the potential to play a more significant role in the nation's economic growth and development.

Concern for vocational education is concern for the world of work. It is concern for the employer who hires vocational graduates and creates jobs that help make the economy prosperous. It is concern for experienced workers, for the youth who are at the threshold of promising careers, and for the new role of women who seek opportunities to be more productive in the workplace. It is concern for the economic well-being of the nation.

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Collaboration: Vocational Education and the Private Sector

John C. Graves

The need to develop collaborative efforts between the private sector, government, and the educational community is apparent, in light of the ever increasing number of our nation's youth and adults who lack the basic skills to either enter the job market or compete for promotions in new high-technology markets. The problem is evidenced by alarming statistics. According to the Center for Public Resources (CPR), 13 percent of white, 43 percent of black, and 56 percent of Hispanic 17-year-olds are functionally illiterate. In addition, between 40 percent and 50 percent of all urban students suffer from serious reading problems.

In light of these statistics, the findings of a recent survey conducted by CPR are even more disturbing. This survey of over 2,000 corporations, 60 unions, and 400 school systems evidenced the strong discrepancy between public and private sector opinions of the adequacy of the preparation of high school graduates for employment. While the corporations noted significant student deficiencies, especially in reading, mathematics, and science, 75 percent of the schools reported their graduates as adequately prepared in these areas.

This communication gap between the private sector and public education must be bridged if we are to adequately prepare individuals for the world of work. The incentives for such a collaboration should be apparent to all parties. In order for this effort to start, there must be agreement on the problem and a sharing of not only approach, resources, and skills, but also results. This is imperative if we are to resolve the growing gap between school and work. One model of such collaboration is provided by the Rocky Mountain Energy and Environmental Technology Center in Colorado.

THE COLORADO MODEL

Unemployment in Colorado, as elsewhere, has remained a pressing and growing problem. Many young people, particularly disadvantaged minorities, have no work experience and limited educational backgrounds.

As a consequence, they have not learned the skills needed to be successful on the job. The problem is further complicated by dropping out of school with no clear perception of what the future will bring. With the decline in the manufacturing sector of our economy, many adults have been forced to change careers and relocate to environments offering a brighter employment future. Business leaders and educators alike have been challenged to improve the transition of youth and adults into or within the world of work. This lack of career entry and career change skills among significant segments of our society affects not only the individuals personally, but also industrial productivity and our economy and society as a whole.

Mutual Interests

Coloradans are deeply concerned about this problem. The state is interested in providing jobs to its unemployed. Industry is interested in reducing new hire turnover and in hiring employees who understand the world of work, have good job skills, and can succeed in the workplace.

With these mutual goals in mind, the state of Colorado and Rockwell International in 1978 joined in a collaborative effort to provide job training to Colorado's disadvantaged youth and adults. The resulting model program goes well beyond collaboration and is a genuine partnership which benefits the state, local government, industry, and disadvantaged individuals.

The program is referred to as RME & ETC (Rocky Mountain Energy and Environmental Technology Center) and is located in Denver on a former community college campus. RME & ETC today is unique in many respects.

Diversity of Primary Partners

The partners in the Colorado model represent a widely diverse group of organizations from industry, state government, county government, post-secondary education, CETA sponsors, and other referral agencies, such as vocational rehabilitation, veterans affairs, and individual organizations and agencies. The partners include Department of Energy/Rockwell International; the State Board for Community Colleges and Occupational Education; the Community College of Denver, Red Rocks Campus; CETA prime sponsors in Weld, Jefferson, Larimer, Araphahoe, and Adams counties; and several state agencies, including the Colorado Department of Labor and Employment and the Office of Manpower Planning and Development (OMPD). The OMPD became the governor's job training office in 1983 and was transferred to the governor's office from the Department of Labor and Employment.

Clearly, such diversification among key organizations is complex and requires honest, open, and continuous communication. Industry and prime sponsor advisory committees are active, meet regularly, and critique as well as advocate for the center.

Program Participants and Instructors

Of those being trained in the program, roughly 50 percent are Rockwell employees, and the remaining 50 percent are CETA clients.

All skill training instructors, with the exception of the general clerical instructor, are employees of DOE/Rockwell and members of the American Steelworkers Union. All instructors are vocationally credentialed. DOE/Rockwell pays all instructor salaries, except for the clerical instructor.

Training Approach

All training programs are fast track (three to six months) and offer the equivalent of 36-48 community college credits. The programs are intensive and offer open entry and open exit for participants. Each course is highly individualized and uses a competency-based curriculum developed by instructors from Rockwell and other industries in collaboration with the Community College of Denver staff. Industrial standards for job behavior and work habits are strictly enforced. All enrollees receive community college credits and are entitled to all the privileges of enrollment in a community college program, such as library use and recreational facilities.

Support Services

A comprehensive array of support services are available. These include competency-based, computer-managed, and computer-assisted instruction in basic and occupationally related classes; job development; bilingual counseling; English as a second language; job placement and career counseling; and industrial behavior. These services are very student centered, while stressing the realities of the work world. Costs for these services are borne by the referral agents, which include CETA sponsors and the Office of Manpower Planning and Development.

Program Flexibility

Training programs are added or deleted based solely on labor market demand and are not designed to meet only the needs of one employer. Courses have been closed because of declines in labor market demand and reopened when demand increased. Programs for new or existing industrial partners can be started at any time. Because of the center's administrative flexibility and experimental programs, methods can be implemented and tested. If

successful, the methods can then be transported into other existing vocational programs and facilities.

Joint Onsite Management

DOE/Rockwell supports the cost of an onsite manager who is responsible for managing DOE/Rockwell instructors and trainees; supervising industrial curriculum development; assuring maintenance of DOE/Rockwell's equipment; planning and developing new training programs for DOE Rockwell; and managing DOE/Rockwell's fiscal investments in the center. Management of all other functions is performed under a third-party contract between the Office of Manpower Planning and Development and Resource Development and Management Systems, Inc. (RDMS). RDMS is responsible for overall maintenance of the center; day-to-day relationships with DOE/Rockwell and the community college coordinators; all support services and related class instruction; maintaining prime sponsor accounts; and program development.

HISTORICAL DEVELOPMENT

The evolution of the training center to its current status is complex. It began as a single, three-month pilot project designed to train disadvantaged individuals to be chemical operators, and has become a multi-service, multi-training program center. The initial partners were the OMPD, DOE/Rockwell, and the Community College of Denver, Red Rock Campus (CCD/RR).

OMPD made funding possible for the initial three-month program. An instructor for that pilot program was provided by the community college. Rockwell provided in-house training materials. In April 1978, 14 of the 16 original trainees completed the course and were hired by Rockwell.

The previous fall, the Department of Labor had released $250 million provided under the 1977 Economic Stimulus Appropriations Act. The money was allocated through the Skill Training Improvement Program (STIP) and administered through CETA funds to state and local prime sponsors on a competitive level.

The STIP's primary purpose was to finance programs to train the unemployed in skilled work and to situate them in unsubsidized private sector jobs. The solicitation for grant applications specified that the STIP was patterned to meet industrial requirements for certain skills and to increase private sector participation in the design and operation of employment and training programs.

Rockwell Becomes Sponsor

In May 1978, the Denver Employment & Training Administration re-

quested that DOE/Rockwell become the industrial sponsor in a STIP machine tool operations program. DOE/Rockwell consented to participate in the nine-month training program for 30 trainees starting July 5, 1978.

A machinist from the DOE/Rockwell work force was chosen to design the training curriculum. Other journeymen from the United Steelworkers of America employed at DOE/Rockwell were consulted on the program's structure. Surplus industrial production machinery or machinery not being used at Rockwell was donated to serve as teaching equipment for the program.

Meanwhile, the OMPD had been toiling to develop the comprehensive job strategy based on Governor Richard Lamm's speech that introduced the "Job for Coloradans" plan. The strategy called for coordination among government agencies and industries in implementing training programs for the economically disadvantaged. As part of this strategy, the OMPD had cultivated several training programs coordinating various agencies at the state level.

Facility Obtained

The community college inaugurated its new North Campus Facility in the summer of 1977. At that time, the State Department of Buildings acquired the college's former campus. The Colorado Department of Labor and Employment obtained the campus in the spring of 1978. The original intention was to use the facility for office space, but the OMPD administration soon realized the opportunities the campus provided for skills training for CETA participants.

When the OMPD saw Rockwell's interest in CETA training and its need for an offsite training facility, it offered a portion of the old campus as a training site. The OMPD and DOE/Rockwell then agreed to coordinate efforts to meet their common objectives.

The name of the center, The Rocky Mountain Energy and Environmental Technology Center, was formulated when the machine tool operations program relocated to the old campus on September 5. With that move, it was recognized by both the OMPD and DOE/Rockwell that the facility would accommodate additional energy and environmental skills training programs in the future.

Jeffco Expressed Need

In August 1978, the Jefferson County (Jeffco) prime CETA sponsor expressed a need for a word processing training program. A six-month training course was established. Jeffco agreed to finance the program with STIP funds because it needed a skill training program patterned for clients receiving aid to families with dependent children. Instructors for the program

were provided by DOE/Rockwell, who also designed the course curriculum. Twenty-one word processing machines were leased by DOE/Rockwell. This program was launched October 16, 1978.

After the machine tool operations and word processing programs were progressing smoothly, a third program was soon on the drawing board. The OMPD staff next worked with DOE/Rockwell to develop a skill-oriented program to train chemical operators. Planners saw the chance to coordinate agencies at the federal, state, and local levels in both the program planning and implementation stages.

In October 1978, representatives from OMPD, the DOE/Rockwell, the State Board for Community Colleges and Occupational Education and the Community College held a planning session to discuss a training program for chemical operations. That meeting resulted in a formal request being submitted by the college to the state board. That request, which won approval, asked for provision of college credit for a 4-month, 40-hour-week chemical operations training program.

The OMPD agreed to finance the costs of upgrading the center to accommodate the chemical operations program plus ensuring operating costs. DOE/Rockwell provided the curriculum, training equipment, management expertise, and instructors from its plant work force at Rocky Flats.

Equipment Provided

As in the machine tool operations program, the training equipment consisted of production vessels and either surplus or unused industrial equipment from the Rocky Flats Facility.

On November 6, 1978, 20 trainees started a six-month chemical operations training program at the center. Six area prime sponsors had referred the trainees individually for the program.

The chemical operations program represented the climax of combined efforts by the OMPD and DOE/Rockwell to coordinate federal, state, and local agencies and the private sector in attaining common training objectives. Included in that contract for the chemical operations program were all of the aspects considered necessary for a coordinated training plan. The result was a viable model for the development of second cycle training proposals for the machine tool operations, word processing, and chemical operations programs.

Second Shift Started

To train more students due to increasing job demands, second-shift classes were implemented in the word processing program and the machine tool operations program in May 1979. By expanding those programs, each could accommodate twice the number of trainees.

A fourth program, the pipefitter/welder program, was established when a need arose at Rockwell to provide more pipefitter/welders for increasing jobs at the plant. Rockwell's need for pipefitter/welders began to increase in the late 1970s, along with growing job demands in that occupation in other energy related fields around the state.

In answer to this need, the first six-month pipefitter/welder program was developed at the center. Delivery of training started on March 17, 1980, during the third cycle for the center's other three training programs. Twenty-five students were enrolled in that first pipefitter/welder program.

As in previous programs, instructors for the pipefitter/welder program were selected from the Rockwell work force.

Completers of the first pipefitter/welder program finished their training on September 15, 1980, with some early completers. A fourth cycle of 20 trainees started October 1, 1980 and was completed on March 31, 1981. Again, with the open entry, open exit concept, a number of trainees completed the program ahead of the six-month schedule.

Employee Assessments

Since 1980, the second shift has been terminated because of decreases in labor market demand, as has the [illegible] operators program. Two new programs, lab technician and metallurgical operator apprentice and progression, have recently been initiated. In addition, DOE/Rockwell has begun using the computer-managed and computer-assisted instruction program operated by RDMS at the center to conduct preemployment assessments of new employees and to upgrade the basic skills of its current employees. With this system, once an employee is tested, a prescription for learning is generated and kept in the employee's file for future training. This approach has cut the cost of training and has helped Rockwell keep up-to-date on all training needs.

The Future of RME & ETC

One of the original underlying purposes for the development of the RME & ETC was to demonstrate the efficacy of a public-private partnership in preparing disadvantaged persons for competitive employment. This partnership was to involve multiple state and local agencies and private concerns, and was to provide training in a flexible environment where experimentation could flourish. Clearly, the efficacy of the model has been demonstrated.

Our challenge now is to demonstrate that the RME & ETC model can be incorporated into and expanded within the existing state system of vocational education. To achieve that end, the administration of the RME & ETC is currently being shifted from the Office of Manpower Planning

and Development to the State Board of Community Colleges and Occupational Education. Under this new structure the state board will administer the program through one of its local institutional agents. All existing services and partnerships will be maintained. Moreover, new public and private partners and new programs and services to additional client groups will be added. All those involved believe this transition will continue and will enhance the dynamic evolution of a creative, worthwhile public-private partnership.

Shared Benefits and Responsibilities

We at Rockwell International-Rocky Flats believe in collaboration and the benefits it beings to everyone involved. Regardless of all the efforts by the government to stimulate collaboration, all the parties who can affect change must first agree to collaborate. That agreement will only happen when all the parties can see the benefits.

Cooperation from the public sector view is usually seen as business/industry and labor serving on advisory boards. From industry's perspective, it is viewed as a community service with little or no expected results.

However, at the Rocky Mountain Energy and Environmental Technology Center, collaboration means shared responsibility for identifying the problem, agreeing on the solution, developing the curriculum, helping in acquiring the resources, and mutually sharing in the results. We believe collaboration is buying in on an equal basis, becoming partners in the total effort. The results of such collaboration at RME & ETC have been highly beneficial to Rockwell and the public sector--and even more importantly to the people we train.

CONCLUSION

Today, because of high unemployment and lack of resources, we as a nation are once again faced with the need for cooperation and collaboration efforts like those mounted in World War I, World War II, and in the 1960s.

Representatives from differing sectors of the community, sharing equally in the responsibility for identifying and removing barriers that hinder the transition from education/training to work, should be the order of business in each community. This must be a high priority if we are to begin to bridge the gap that exists between education and work.

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Issues in Collaboration Between Organized Labor and Vocational Education

Kenneth R. Edwards and Theresa M. Carroll

Organized labor in the United States has long been committed to the goal of achieving full employment for an adequately trained and highly productive American work force. Labor has looked upon full employment as the result of a balance among overall fiscal, monetary and trade policies, accompanied by comprehensive programs for training and employment. Training has always been an essential component, for when the nation can rely upon adequately prepared workers in the job market, long-term growth and economic stability are directly enhanced.

It has been the practice for many trade unions to make available to their members various training opportunities. Joint apprenticeship training programs and journeyman-level skill improvement courses are two of the avenues available to members of organized labor. These programs are designed to develop both the specific manual skills and the broadly based theoretical knowledge necessary for workers to practice their crafts proficiently and productively.

LABOR'S COMMITMENT

In February 1983, the AFL-CIO Executive Council adopted a statement on education in America and articulated its position on several related issues ranging from tuition tax credits to Indian education to vocational education. While adhering to the fundamental principle that education is a right and not merely a privilege, the AFL-CIO urged the Reagan Administration to formulate "a substantive leadership program to enable the nation's public education system to educate and retrain America's current and future workforce."

The adequate training of workers in order to assure their employment and enhance national productivity has always been among the goals of organized labor. Under the apprenticeship systems unions play a major role in determining the nature and quality of entry-level training programs for industry. Nearly one-quarter of American workers are members of trade unions, with membership strongest in the construction and manufac-

turing industries. Unions representing the building and construction trades, the metal trades, and the maritime trades (and also a few industrial unions) have been negotiating apprenticeship training programs since the turn of the century. Both the building trades and the maritime trades have established their training programs through trust funds jointly supported by employers and unions.

By emphasizing in apprenticeship training the acquisition of a broad knowledge base for the practice of a particular craft, organized labor seeks to foster flexibility and adaptability among workers. By designing programs to produce journeymen who possess both technical and theoretical knowledge of a craft, unions attempt to prepare workers to undertake further journeyman-level retraining when it becomes necessary or advantageous.

The Education/Work Connection

On the issue of retraining, the AFL-CIO Executive Council observed in its 1983 statement: "Putting America back to work will often depend on our ability to send America back to school. Education and training related to job opportunities should be easily and freely available to young people and to adult workers, especially to those who are unemployed."

Labor also recognizes the importance of the role of the public vocational education system in achieving this goal. The Executive Council further exhorted the Congress to authorize realistic levels of vocational education funding so that more adequate training can be provided in high-technology fields. The joint cooperation of labor, management, local government, and local education agencies is necessary to achieve the effective operation of these vocational programs.

ECONOMIC CONSIDERATIONS

The history of American labor and industry parallels the history of the evolution of technology and its effects on the work force. The continual need to retrain and upgrade worker skills to accommodate changes in job structures is a challenge which labor and industry anticipate and accept as a necessary result of American ingenuity and competitiveness. In dealing with innovations over the years, unions have repeatedly seen the value of their traditional emphasis on the broad educational preparation of workers.

Today, however, a combination of factors has intensified the retraining challenge: a revolution in high technology, a recession in our economy, and abrupt changes in the demographics of the American work force. The need to retrain is now so acute as to be more than a readily manageable result of industrial progress. Technology has leapfrogged, and continues

to leapfrog, at astonishing rates. While effects on the work force are being analyzed, new advances are being made, so that employers and employees in many industries must deal with constant flux.

The contemporary literature in human resource development abounds with analyses of the need for retraining and of the psychological and social impact of the technological revolution. There is a crucial mismatch between the skills required by industry and the skills available in the work force.

Impact of Unemployment

In the midst of the current recession, our unemployment rate hovers around 10 percent. Business bankruptcies are at their highest level since the 1930s, and more than 30 percent of American industrial capacity is lying idle. Some observers argue that we are moving away from an industrial base toward a more service-oriented economy. Our manufacturing industries are declining, in part because of the failure of the federal government to revise U.S. trade laws. Our auto and steel industries are not alone in feeling the adverse impact of foreign imports; the computer industry, fiber optics, computer chips, integrated circuits, and the commerical aircraft industry are also experiencing hard times.

In May 1982, the Building and Construction Trades Department of the AFL-CIO reported that with the increase in business failures and the high rate of unemployment, many construction workers are leaving the industry completely. Unemployment in the building trades ranges from 1 percent of Houston, Texas, iron workers to 98 percent of painters in Worcester, Massachusetts. If workers continue to leave the construction industry, it will have a difficult time rebounding when the economy does pick up again. Our skill base could be seriously eroded by that time, not only as a result of the exodus of trained craftsmen but also as a result of insufficient entry-level training. It is conceivable that we would then see the reverse of the current situation, so that when construction jobs do become available, we may not have enough qualified workers to fill them.

Impact of Technology

Concurrent with the effects of the depressed economy, most industries are experiencing radical transformations in the nature of work because of the revolution in technology. Several unions are responding to these changes by working with their employers to update and modernize the training their members receive. Many of these unions are in severely depressed industries such as mining, steel, and rubber products manufacturing. Unions belonging to the building and construction trades are in the process of pooling their pension funds in an attempt to stimulate the construction

industry. This will allow unemployed members to become employed again and will also generate revenues for training trust funds that are currently being exhausted. Contributions from employers to the training programs are usually based on the number of hours worked, and as employment has dropped so have these contributions.

Organized Labor Responds

Organized labor is responding to the current economic situation in several ways. The United Auto Workers have agreed to roll back wages and have insisted on retraining provisions in their collective bargaining agreements. The Auto Workers have agreed to a five-cent per hour contribution to a fund specifically designed to help finance retraining. The American Federation of State, County and Municipal Employees has established upgrading and basic education programs in the health and allied medical fields. The International Association of Machinists has revitalized its apprenticeship and training endeavors in an effort to alleviate critical skill shortages. The Screen Actors Guild, the Textile Workers, and the Communications Workers have already established or are currently putting into effect apprenticeship and training programs; some of these groups have never previously been involved in this type of training.

Without the creation of new jobs, however, retraining efforts cannot be completely effective. The efficacy of retraining is directly proportional to our ability to create new jobs to employ those who have been retrained.

Calling upon the Reagan Administration to respond to our economic problems with strong measures to combat joblessness, the AFL-CIO has urged public investments to create jobs and to train workers in scarce skills.

Even though numerous federally assisted programs have been drastically cut or phased out, segments of organized labor are still involved in outreach, preemployment training, job search assistance, training within correctional institutions, the Job Corps, and other community development programs. With the passage of the Job Training Partnership Act in October 1982, many labor groups are participating under Title III in the training of dislocated workers through programs in local community colleges.

The Noneconomic Costs of Unemployment

The social and psychological costs of plant closings and industry failures are more subtle aspects of the retraining problem which nevertheless are rooted in economic causes. Workers who previously have not been unemployed often become confused and fail to perceive that they do have marketable skills or skills that can be adapted to the new technology or to some other type of employment. The problem is compounded when there are no jobs available in the community, or when the community relies on

a single business or industry that cannot continue to support the local economy or that decides to relocate completely, leaving workers and the community stranded.

This difficulty points to the need to educate workers to appreciate the fact that further education, training, or retraining is a necessity. Part of the training function, then, involves the changing of attitudes.

RELATIONSHIPS IMPROVING

Organized labor and the vocational education system in America have not enjoyed a high degree of interaction and cooperation in recent years. As the vocational education system in America has matured, a widening gulf has developed between vocational education and labor.

In the latter part of the nineteenth century, however, organized labor turned to trade schools in Chicago to educate union members in certain vocational skills. In an effort to prevent the awarding of jobs to alien workers, unions found it necessary to tap into the existing system of trade schools, which were equipped to teach the up-to-date skills needed by their members. Unfortunately a sense of rivalry has evolved over the years between the vocational education system and the training programs jointly conducted by organized labor for its members. This attitude is most noticeable in the service and industrial trades, but actually exists in all the trades.

At the local, grassroots level, this tradition of rivalry is gradually eroding. There is probably a better relationship between union training programs and vocational education in this country than most people believe. In most cases, organized labor is ready and willing to cooperate with vocational educators at the local level. Local unions are very knowledgeable of local labor markets and of the skills and proficiencies that are most in demand. Union members are able to share their perceptions of what is required to perform as a skilled worker. To a certain extent, local union officers and members are available to offer students vocational guidance and to participate in career days; some union officers and members are occasionally available as instructors.

Need for Greater Understanding

While local cooperation between vocational education and organized labor should definitely be encouraged, there is a great need for more trust and communication between the two systems. Each needs to acquire a better understanding of how the other system works. The main drawback is that apprenticeship training and journeyman retraining are industrial endeavors, whereas vocational education is strictly an educational endeavor. As vocational education develops more performance-based standards, the

two systems will probably be more closely linked. Effective mutual communication is the single most important ingredient that must be fostered if a truly synergistic relationship between labor and vocational education is to result.

The 1983 statement of the AFL-CIO Executive Council contains direct references to cooperation between labor and vocational education. The Council said: "We also urge the Congress to explore new initiatives for the retraining of adult workers through the vocational education system, to provide incentives and support for the training, retention and upgrading of teachers, and to continue and strengthen the requirements for labor representation on local advisory councils. We recognize that the joint cooperation of labor, management, local government, and local education agencies and institutions is essential for the effective operation of vocational programs to meet the needs of workers, their employers, and local communities. We urge all AFL-CIO affiliates to support such cooperative efforts in every possible way."

ATTITUDES TOWARD TRAINING

In terms of apprenticeship-level training programs, unions and employers often vary greatly in their approach to the design of such jointly sponsored programs. In many trades, employer associations seem to prefer competency-based training techniques. Employers prefer narrow, specialized development, while unions prefer broadly based programs that develop a maximum of transferable skills. Unions also feel that broadly trained members acquire a better knowledge base to carry with them throughout their careers.

Some unions have cited excellent results using this modular method, and other unions have not been satisfied with the outcomes. The chief criticisms of these training techniques include the failure of such methods to impart problem-solving skills and to inculcate the kind of reasoning ability needed for employees to adapt to varied challenges on the job. While those who are trained by programmed, modular, competency-based methods rank high in knowledge acquisition and knowledge retention, they have not been as successful in developing interpersonal skills or in demonstrating adaptability on the job.

The training of union members other than apprentices is less formal and usually does not involve a selection and evaluation process. Most established craftsmen, such as journeymen, who are seeking skill improvement training, prefer short, no-frill courses that are timely, concise, and taught in a familiar environment. Many types of journeymen upgrading courses are also available in cooperation with the established vocational education community.

In-Plant Training

Organized labor has a tradition of concern for in-plant training. Unions feel that a great deal of on-the-job training is acquired when workers gradually assimilate the procedures and techniques being used at the workplace. The trend today is for unions to attempt to gain more control over in-plant training programs.

In their effort to obtain training for their current and future membership, many unions elected to tap into federal funds when they were more available than at present. Some programs involved retraining of displaced workers at vocational education institutions. Unions have, in the past, obtained funding under the National Defense Act, the Comprehensive Employment and Training Act, the Area Redevelopment Act, the Manpower Development and Training Act, the Trade Adjustment Assistance Act, or through special grants from one of several federal agencies. These funds have been used not only as seed funds for training endeavors but also for short-duration upgrading programs.

Tuition-Aid Programs

Tuition-aid programs are another example of a retraining opportunity available to union journeymen. Most tuition-aid programs are unilaterally controlled by management. Because of this, a union can do little for a member who has been denied participation in the program, since the plan is usually not subject to the grievance procedure. Some unions feel that these programs are used primarily to serve the employer as a source of windfall profits, rather than to benefit employees and to enhance the company's productivity. On the other hand, tuition-aid programs have been used successfully in some cases.

The American Federation of State, County, and Municipal Employees (AFSCME) in New York City has made excellent use of negotiated tuition-aid programs. They have insisted that tuition aid funds be put at their disposal. In turn they have contracted with institutions that are providing upgrading training for their members.

Other industrial unions have begun to give serious consideration to negotiating tuition-aid funds in their collective bargaining agreements. The United Auto Workers are negotiating for paid educational leave or time off the job for education and training at the employer's expense. New contract settlements, such as the agreement with Ford Motor Company, call for the retraining of workers whose jobs would be affected by the new technology.

The Communications Workers of America (CWA) are seeking practical means of helping their members adjust to the disruptions caused by rapid technological change in their industry. They have recently opened a train-

ing center in Indianapolis where office automation, computer literacy, and career planning are taught to telephone company workers. Four more training centers are to be opened before 1984 to assist CWA members in other parts of the country.

The Machinists and Aerospace Workers International Union has even drawn up a Workers' Technology Bill of Rights. This document declares that displaced workers have the right to receive training and retraining and to participate in company decisions about the introduction of new technology in the work place. This Bill of Rights seeks to articulate the position that new technology should be used to improve working conditions and to expand workers' opportunities to grow in knowledge and skill within their industry.

Retraining in Community Colleges

A significant portion of the collaboration between organized labor and vocational education takes place through the community and junior college system. Negotiated tuition-aid and educational leave programs give thousands of union workers the opportunity to tap into journeyman-level training and education. Liaisons may also occur at the apprenticeship level. Because they are based in the community and draw upon local resources to meet local educational needs, programs offered in community and junior colleges have a unique relationship to the practical needs of the local labor market. In fact, employer requests and union requests often provide the impetus for program development.

Labor advisory committees are typically present in communities where organized labor is involved with higher education. These committees allow union officers to participate in the decision-making process relative to course offerings, curriculum design, faculty selection, student recruitment, and, in some cases, government funding. Advisory committees also provide an excellent arena for communication and collaboration between vocational education and organized labor.

Some labor unions have demonstrated particular interest in labor studies degree programs which are designed specifically for union members. Such programs are made available primarily through community colleges. Union members who are enrolled are typically older and part-time students, although some apprentices are involved concurrently in their indentured apprenticeship training and in an associate degree program in labor studies. The labor studies curriculum is an excellent preparation for potential union leaders, since increasing demands are placed on union leadership in today's workplace. Labor studies course offerings usually encompass labor history, labor law, collective bargaining and negotiating techniques, economics, and union administration.

IN CONCLUSION

High unemployment has turned the nation's attention to our training needs. Technology has revolutionized the skills needed by workers to perform in current occupations. Since January 1983, the U.S. Congress has generated more than 200 proposed bills dealing with the question of high technology and its effects on workers. Extra funding for training teachers of science and mathematics is being considered, as well as tax incentives to encourage corporate donations of high-technology materials to our schools.

Many people are calling for national policies to stimulate business to invest more money in training and retraining its own employees. The Office of Technology Assessment, U.S. Congress, has undertaken a study of the impact of programmable automation in manufacturing on labor and employment, education and training, and the overall quality of the work environment. The President himself has addressed the issue of dislocated workers at the National Conference on the Dislocated Worker held in Pittsburgh in April 1983. The Job Training Partnership Act constitutes a small initial effort to direct federal funds toward the retraining of displaced workers, but cannot be expected to solve the more basic problems of skill shortages in industry or the actual creation of new jobs.

The retraining issue has aroused interest and attention. All individual workers must come to regard retraining as a natural consequence of the technological revolution. Retraining is essential to maintain and update skill levels, to learn more efficient methods of work to enhance productivity, or to respond to the restructuring of occupations which will make some jobs completely obsolete.

The Need for a National Policy

In formulating a national industrial policy, retraining will not be enough to maintain our economy over the next 20 years. Initial training and education for the unemployed and for those who are still in school must be more responsive to the current and emerging needs of American industry. Educators and trainers are nearly unanimous in their belief that no single education will last an individual for a lifetime. That belief is becoming a certainty in the midst of the rapid changes we are experiencing. Students should be leaving schools, and apprentices should be leaving their entry-level training programs, with adequate preparation to grow and learn beyond their graduation competencies by being able to draw from and build upon a solid educational foundation.

Unlike many other industrialized nations, our country has neglected to formulate a technological policy which speaks to the likelihood of an entire range of radical changes in our work force. Such a policy should encom-

pass (1) the effects of technology on our work force; (2) ways to avoid or ameliorate the social and economic waste caused by unemployment; (3) research directions to explore future needs; (4) statistical projections of new employment opportunities; (5) compensation levels for those who lose their jobs; (6) effective utilization of current personnel; and (7) the effects of technology on the education, training, work, and leisure time of the average citizen.

The American labor market is in swift transition. Our future success will depend upon how well all tiers of the educational system prepare workers to keep pace with changing industrial demands. Organized labor stands ready and eager to protect the welfare of its members and the nation by cooperating in this training endeavor. The approach must be collaborative, involving cooperation among labor, business and education, and involving governments at the federal, state, and local levels.

Collaboration in Apprentice Programs: Experience with In-School Apprenticeships

Robert W. Glover

Historically vocational education and apprenticeship developed separately and they operate largely independently today. Recently, the U.S. Department of Labor attempted to encourage linkage between vocational education and apprenticeship for high school seniors. Most of the projects involved placing cooperative education students into apprenticeships while they were still in school; but some projects involved participation of other vocational students. For example, in some areas vocational lab students were released from class by instructors for on-the-job experience. In others, seniors not participating in cooperative education went to work as apprentices after school, occasionally under early release arrangements. This chapter reviews the results of these projects and points out a new way that vocational education and apprenticeship can be partners in training.

A HISTORY OF PARTNERSHIP

Vocational education has long been regarded as a partner to apprenticeship in providing supplemental, related training. Even though there is a trend among the larger, better-financed apprenticeship programs to withdraw from public schools and acquire their own facilities for related training, a significant portion of apprentices continue to be assisted in their related training by public vocational education. According to the Vocational Education Data System (VEDS), there were 142,408 apprentice enrollments in vocational courses during 1979–80. At the same time, there were approximately 300,000 apprentices registered with the U.S. Bureau of Apprenticeship and Training or with state or territorial apprenticeship agencies. Thus perhaps almost as many as half of all registered apprentices were served in some way in their related training by vocational education in 1980. The most common form this assistance has taken is to pay all or part of the salary of instructors for related training. Other forms of assist-

The author wishes to thank Ed Davin, Kay Edwards, and Daniel Burkitt for their helpful comments on the draft of this chapter.

ance include provision of training facilities for related instruction, training and certification of apprentice instructors, and development of curriculum materials.

With the rise of cooperative education since the 1960s, some might ask "Why promote apprenticeship now that vocational education has its own school-based form of work-study training?" Cooperative education and apprenticeship may be seen as substitutes for one another. Both aim to provide trainees with theoretical knowledge as well as practical experience. Both involve learning in the classroom and on the job. In both, employers conduct training under written agreements or contracts. Although cooperative education is used in a wider spectrum of occupations including sales and office occupations not considered apprenticeable, certain cooperative programs provide training in industrial trades and crafts traditionally served by apprenticeship.

Such overlap between cooperative education and apprenticeship may be desirable, for it opens the possibility of combining apprenticeship with cooperative education in such a way as to strengthen both training systems. Rather than substitutes, cooperative education and apprenticeship may complement one another in preparing young workers for careers in the skilled trades.

A variety of experimental projects across the country has proven it feasible to establish part-time, in-school apprenticeships to be continued on a full-time basis upon graduation. Adding apprenticeship to vocational education at the high school level offers an effective means to overcome the inherent limitations of training that can be provided in high school. At the same time, by developing new apprenticeship training positions especially for high school students, the experimental projects have overcome an important limitation manifested in the current American apprenticeship system: lack of access for high school students.

Before proceeding further, perhaps it is best to provide a brief overview of apprenticeship and its characteristics as practiced in the United States.

APPRENTICESHIP: WHAT IS IT?

Apprenticeship is a voluntary, industry-based training system that involves a written contractual employment agreement between apprentices and their sponsors. The sponsor promises to make available a broad and structured practical and theoretical training of an established length in a recognized occupational skill category. Apprenticeship is a work-study scheme that provides a systematic program of on-the-job supervised training supplemented with related instruction, often provided in a classroom setting. Depending on the occupation, the length of apprenticeships may range

from one to six years, although the average length runs three to four years. Apprentices are regular employees and are paid a wage which progressively increases as their level of skill advances according to a predetermined arrangement specified in the apprenticeship agreement.

An apprenticeship program may be sponsored by a single employer, by a group of employers, by a single employer working jointly with a union, or by a group of employers working jointly with a union. Eighty-five percent of the 51,442 apprenticeship programs registered as of December 31, 1979, were sponsored unilaterally by single employers. However, the larger programs were jointly sponsored by a group of employers and a union. Although these comprised only 8 percent of all programs, they contained 55 percent of all active apprentices in 1979.

In America, apprenticeship is concentrated in the construction industry, especially the unionized building trades and in the maintenance departments of large-scale manufacturers. Together these two industrial sectors account for fully three out of every four apprentices in the United States.

Standards and Reputation

Apprenticeship programs meeting certain minimum standards may be registered with the Bureau of Apprenticeship and Training in the U.S. Department of Labor or with one of 32 apprenticeship agencies in the states and territories. The standards aim to ensure quality, standardized training, the use of a written apprenticeship agreement, a progressively increasing wage scale, use of reasonable probationary periods, appropriate credit for prior work experience and training, journeyman/apprenticeship ratios suitable for training, nondiscrimination, adequate recordkeeping, and recognition of completion. Graduates from registered apprenticeship programs are issued a certificate of completion by the registration agency.

Apprenticeship is designed to train for the industry rather than for an individual employer and completion of apprenticeship establishes skilled worker status and transferable qualifications.

Many apprenticeship programs have reputations for providing high-quality training that leads to high-paying skilled craft jobs with opportunity for advancement. Such training is eagerly sought after. Indeed, several well-established apprenticeship programs normally have as many as 10 or 20 applicants for each training position available. Given such popularity, sponsors can be quite selective in choosing apprentices. For example, apprenticeship slots in manufacturing are often reserved for existing employees and allocated in part on the basis of seniority. Also, many sponsors give preference to military veterans over other applicants. Perhaps most important, sponsors tend to view apprenticeship training as a major invest-

ment and thus choose apprentices who are "mature and settled down" and likely to stay with the firm or trade.

National Variation

As a consequence of these and other factors, the age of a starting apprentice in the United States is in the mid-twenties. In this regard, American apprenticeship contrasts sharply with the rest of the world. In every country except the United States and Canada, apprenticeship is a training program for teenage youth. In fact, several countries have set the maximum age for a starting apprentice at 20 years old. In the United States, apprenticeship is a postsecondary training program for adults. Although existing U.S. apprenticeships often provide excellent training, they are not commonly available to high school students or even recent high school graduates.

IN-SCHOOL APPRENTICESHIPS

The concept of the apprenticeship-school linkage projects is a simple one. It involves the employment of high school seniors on a part-time basis as registered apprentices, with transition to full-time apprenticeships upon graduation. As full-time apprentices, they become full-time employees and are responsible for completing their related training requirements, generally through special classes arranged through the local community college or area vocational school.

Beginning in 1977, the U.S. Department of Labor funded a series of eight pilot projects to test the feasibility of in-school apprenticeship. Projects were attempted with a variety of sponsors: local school districts, state education agencies, community colleges, and nonprofit corporations. The results of the projects were carefully evaluated.

Through June 30, 1981, the projects had developed a total of 1,464 new apprenticeship programs and indentured 3,075 apprentices. Most of the apprenticeship sponsors were small employers in manufacturing and service. Only 10 percent were union employers and 69 percent were new to apprenticeship. Almost half of the new apprenticeships were developed in metal working occupations, auto mechanics, or small engine repair.

Project Results

Evaluation of the outcomes of the projects showed that apprentices were more likely than their high school counterparts to continue in jobs for which they were trained. Student apprentices also indicated high satisfaction with the experience whether or not they remained in their apprenticeship positions. Fully 95 percent expressed satisfaction with the program and 96 percent indicated they would recommend apprenticeship to a friend.

Similarly, employers who cooperated reported satisfaction with the projects. Among the employers surveyed by the evaluators, 57 percent said they were very satisfied and 34 percent were somewhat satisfied. Also 55 percent rated student apprentices as better than other young employees, and 63 percent had already recommended the program to other employers.

Perhaps the most convincing evidence that in-school apprenticeships can work is that four of the eight demonstration sites continued the program beyond the Department of Labor funding. Futher, versions of in-school apprenticeship programs under various funding arrangements have been adopted in several other localities in Ohio, North Carolina, New York, Maryland, and Virginia.

COSTS OF THE PILOT PROJECTS

In total, the Labor Department spent $4 million on the projects over a four-year period at an average cost of $1,384 per apprentice. But much of this cost was attributable to a provision for subsidizing employers to participate in the program. One of the projects that did not offer employer subsidies showed an average cost of $268 per apprentice.

Need for Employer Subsidies

Employer subsidies were tried as a part of the apprenticeship-school linkage projects. The projects allowed reimbursement to employers for training expenses up to one-half of the student apprentice's wages, not to exceed $2,100 per student apprentice per year. However, evaluators concluded that these subsidies provided to employers did not generate positive outcomes commensurate with their cost. On the whole, employers were more attracted by the program's emphasis on screening and training of entry-level workers than they were by the subsidies offered. Those employers who were most attracted by the economic incentive of the subsidies also tended to provide the poorest training outcomes.

Moreover, one of the project sponsors, the New Jersey State Department of Education, refused to participate in the employer subsidy portion of the project, preferring to promote the Targeted Job Tax Credit (TJTC) provision available for hiring cooperative education students. Despite this variation, no significant differences in training outcomes between New Jersey and the other sites were found. It should be noted, however, that at the time of the project, Targeted Job Tax Credits were available to employers for all cooperative education students they hired. Under current law, the tax credits are available only for disadvantaged cooperative students. Hence, the New Jersey experience may not be applicable to present realities.

Least Expensive Way Works Well

Perhaps one of the best pieces of news from evaluation of the demonstration projects is that the cheapest means of accomplishing the project worked as well as the more expensive alternatives. Simply hiring one professional coordinator together with a secretary in a local school district seems to work well if they can obtain the assistance and support of existing cooperative education coordinators and local apprenticeship field staff in developing apprenticeship positions, coordinating the training, and establishing appropriate related training beyond graduation.

ADVANTAGES OF IN-SCHOOL APPRENTICESHIP

In-school apprenticeships are attractive because they offer advantages to all participants.

Students get a head start on completion of their apprenticeships. They also receive credit for the training they obtain while in high school, and they don't have to repeat the training as they might if they were to enter a regular apprenticeship after high school. Through in-school apprenticeships, students have part-time jobs related to their training which provide them with possibilities of *both* earning and learning while still in school. Further, under the terms specified in the written apprenticeship contract, student-apprentices are assured that their wage levels will be raised progressively as they advance in their mastery of the trade. Perhaps most of all, in-school apprenticeships assure students of continuing upon graduation in a job related to their training—a position in which they are guaranteed to continue learning and advancing in the trade. At the completion of their apprenticeships, apprentices receive certification as skilled workers.

Advantages to Employers

For the employer, school-apprenticeship linkage offers a means of obtaining workers who have learned some appropriate trade background in school and thus can be productive from their first day on the job. Employers also obtain students who are screened by the schools for their abilities and interest in the trade. The on-the-job portion of apprenticeship offers employers the opportunity to provide further training, especially in specific skills which fit the needs of the firms, and to develop attitudes such as teamwork and loyalty to the firm. It offers an opportunity to provide youngsters with training in advanced skills beyond what they could receive in school or in programs of cooperative education alone.

The in-school apprenticeship concept also provides a means to overcome some of the disadvantages inherent in our present American apprenticeship

system. For example, by increasing the number of employers offering apprenticeships, in-school apprenticeship increases the total apprenticeship slots available. By designating students as apprentices while still in school, the in-school apprenticeship concept offers a means to span the "age gap" which prevails between vocational education and apprenticeship today. It also appeals to apprenticeship registration agencies because it offers a natural vehicle for vocational educators and staff of apprenticeship agencies to work together to promote apprenticeships. Further, if the pilot projects are indicative, the new apprenticeship positions are most likely to be developed in small firms in machinery repair and service trades—areas in which increased training is sorely needed.

For schools, the in-school apprenticeship program offers a means of enhancing the training capability schools can offer their students and of ensuring that students receive good jobs upon graduation. Also, it offers a way to involve employers with schools as partners in training to the benefit of students beyond graduation. In short, in-school apprenticeships can help schools become more relevant to the labor market without compromising their mission of providing general or transferable skills.

LEARNING FROM EXPERIENCE

The apprenticeship-school linkage projects have proven the feasibility of in-school apprenticeships. However, while in-school apprenticeships are simple in concept, the demonstration project revealed that they can be difficult to implement. Success involves achieving collaboration among schools, apprenticeship registration agencies, and employers. The demonstration projects discoverd that it takes about three years to develop full-fledged working relationships. Special care must be taken to follow proper protocol in installing the program in schools. Also, the project is not appropriate for every local area. The local labor market must be able to generate a sufficient number of jobs in the skilled trades involved.

The demonstration projects revealed some points of weakness which should be attended to in any future experience with the in-school apprenticeship concept. For example, because the employers who participated as apprenticeship sponsors were mostly small and inexperienced, setting up appropriate related training beyond high school graduation was often difficult. To alleviate this problem, the in-school apprenticeship project currently operating in Raleigh, North Carolina, aims to get employers to join together in associations to sponsor apprenticeship. By involving the apprenticeship registration agency more fully, utilizing local postsecondary vocational/technical schools, and encouraging employers to associate, problems with related training can be solved.

This chapter has focused on combining vocational education and apprenticeship at the high school level. It should be pointed out that similar arrangements are possible to establish at the postsecondary level as well. Indeed, some apprenticeship sponsors already offer advanced standing to qualified graduates from well-regarded vocational programs in local community colleges and trade schools.

COLLABORATION NEEDED

The in-school apprenticeship concept offers a splendid opportunity for meaningful collaboration between the U.S. Department of Labor and the U.S. Department of Education in a joint venture to promote the spread of such apprenticeships. At a minimum, each department should endorse and publicize the concept. Likewise, in-school apprenticeships can be promoted at the state level in efforts cosponsored by the state department of (vocational) education and the state department of labor and/or apprenticeship agency. In fact, success at the local level normally will require that both state agencies at least endorse the effort to assure legitimacy of the concept with local school officials and apprenticeship agency field staff.

The in-school apprenticeships have considerable appeal; but, given the complexities of implementation, they are not likely to come into widespread use without start-up funding. This might be best achieved by the federal or state governments through offering a special competitive grant program to interested local school districts for three-year start-up funding for in-school apprenticeship projects.

School officials interested in establishing programs of in-school apprenticeships on their own have several sources they can contact for further information. An implementation manual summarizing the experience gained in the projects sponsored by the U.S. Department of Labor has been published. Those who wish to pursue the matter further may want to make contact with national staff of the Bureau of Apprenticeship and Training or with staff of the in-school apprenticeship projects currently in operation. These include Raleigh, North Carolina; Cincinnati, Ravenna, and Youngstown, Ohio; Rockford, Illinois; Des Moines, Iowa; Fairfax County, Virginia; and various localities in New Jersey, New York, and Maryland.

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SECTION IV

Case Histories

As the gap between industry needs and work force skills has widened, there has been a renewed interest in collaboration at many levels to help bring these two forces back into synchronization. This section describes a wide variety of collaborative efforts that have been undertaken to solve specific problems in both the public and private sectors.

In the first article, Moody Oswald discusses South Carolina's efforts to increase the effectiveness of its existing collaborative network through a comprehensive industry and community awareness program.

David L. Smith and Patricia B. Langlin report on California's success with Regional Occupation Centers and Programs in producing vocational education programs highly sensitive to the needs of both industry and the community.

Cecil L. Groves looks at the results that can be obtained when the educational community seeks the support and guidance of business in establishing educational objectives and designing and implementing educational programs. Although this is a departure from traditional practice in higher education, its success demands consideration from the educational community.

Larry W. Johnson highlights the unique efforts of the Vocational Industrial Clubs of America in increasing industry awareness of vocational education's capabilities through the Skill Olympics and in eliciting support for the program's maintenance and expansion.

Gerard G. Gold writes about successful efforts arising at the community level to bring industry and education together to solve skill/manpower discrepancies, turning mutual problems into mutual solutions.

William H. Kolberg examines the effects of private industry's role in vocational education development afforded by private industry councils, set up as an advisory adjunct to CETA and strengthened with the passage of the Job Training Partnership Act in 1982.

William Spring describes the creation and programs of the Boston Compact, an agreement between the Boston Public Schools and the private sector to improve education and employment opportunities for young people. The author explores partnerships between individual businesses and schools; the revamped school program, under which all secondary schools stress employability and job readiness for *all* students; and the agreement by 200 companies to hire 400 high school graduates in 1983.

These seven articles illustrate the enormous potential of collaboration as a means for developing effective educational programs that provide real benefits for both the public and private sectors.

Lillian Bates

Revitalizing an Old Medium: Using Advisory Committees

Moody Oswald

Although South Carolina established vocational education advisory committees and councils under state and federal legislation in the late 1970s, concern about their effectiveness led to a 1981 study by the Office of Vocational Education. Advisory councils at the school level and advisory committees at the service and course levels had been directed to study program offerings, to establish specific goals and objectives related to educational programs, and to make recommendations for improvement based on the needs of students.

The study found that the advisory groups were having little or no impact on the vocational programs they served. The 1,000 advisory committee members queried reported that they viewed their advisory groups as having no impact on the vocational education programs they served. Statewide, 70 percent of the respondents reported that their advisory group had no recommendations implemented. Less than one-third of the advisory committee members reported that recommendations had been made and implemented.

REVITALIZING THE COMMITTEES

The Office of Vocational Education took corrective actions based on these findings. It believed that linking vocational education to the community through advisory committees had become critical due to job obsolescence arising from growth in technology usage, population, and the state economy. These trends made it important to build bridges between the community, especially business and industry, and vocational education.

In 1982, the South Carolina State Legislature mandated that vocational program advisory committees be established at the local level. Committees had been established prior to 1982, but were not required by state law. In addition to this legislative stimulus, based on the findings of its investigation, the Office of Vocational Education took several steps to revitalize the committees.

Guiding the Committees

The office developed a program guide, *How Your Advisory Committees Can Work for You*, which was introduced to administrators during a 1982 seminar that focused on developing effective advisory committees. All vocational education instructors received copies of the guide at a 1982 Summer Vocational Education Conference, and were offered inservice assistance in how to use the guide. Many inservice workshops on how to use the guide have been held subsequently at the request of local administrators. More than 3,000 copies of the guide have been distributed.

The guide also has been introduced to leaders of business and industry at Business-Industry-Education Days. These events have stressed the importance of cooperation among leaders of business and industry, the community, and vocational education to help each local community and the state to develop economically. About 20 Business-Industry-Education Days are held in South Carolina each year.

Setting Standards

Vocational education program standards also were used in the effort to revitalize program advisory committees. These standards, developed by the Office of Vocational Education, were established to determine compliance with specific rules and regulations in three major areas—administration, student services, and curriculum. One standard that specifically addresses program advisory committees emphasizes the process of revitalizing these committees. Evidence such as membership lists, minutes of meetings, and representation must be maintained.

Two examples of comments and recommendations made by the Office of Vocational Education during program evaluations of vocational centers follow.

1. The (evaluation) committee commends the instructor for use of his program advisory committee. The advisory committee assisted the instructor in developing an analysis of drafting tasks. This analysis was completed by the appropriate persons in the local industries.
2. Although program advisory committees are established in all areas, the (evaluation) committee recommends that a strong effort be exerted by the administration in coordinating and working with these committees. Thorough evaluations should occur to determine the effectiveness of the joint committees with the TEC (Technical Education Center) and other centers as compared to the single committees. Maximum utilization should be the major goal. The committee encourages that the publication *How Your Advisory Committee Can Work for You* be analyzed and possible suggestions obtained.

Some Results

The revitalization of the advisory committee system has resulted in some direct benefits at the local level. For example, in one county there was a substantial improvement in business's involvement in cooperative education programs offered by the vocational schools.

In a number of areas, businesses increased significantly the number of employees who went into the schools for career awareness and other programs. Some areas of the state also saw increases in business donations of equipment to the centers. Business also increased its efforts to increase community awareness of local vocational education centers.

HOW THE COMMITTEES WORK

Each local educational agency ensures that committee membership is representative of the community population. The South Carolina Office of Vocational Education encourages the selection process to include representation from potential local areas of employment, different age groups, a variety of attitudes toward education, civic and community leadership, people who have participated in the vocational program or who currently have children in the program, and minority groups and both sexes.

The typical program advisory committee has representatives from vocational education centers, technical colleges, and business and industry. In one county, the program advisory is composed of three representatives from vocational education, three from a technical education college, and six to eight from business and industry. This committee's major functions involve the linkage of program offerings at the local educational agencies, the organization of competency-based education, the promotion of school to work transition, and the formation of a communications network between education and business/industry.

Committee members typically serve for a specific period of time, preferably three years. A member serves one term and then is eligible for reappointment until one year has elapsed following the expiration of the previous term. The rotating term system is preferred because it involves more people and obtains varying viewpoints from competent leaders. The Office of Vocational Education encourages the committees to meet at least three times per year.

Committee Operations

The functions and purposes of the advisory committees are spelled out in the guide developed for the revitalization process. Committee members primarily help vocational educators determine objectives that affect the areas of study. Although the committees have no administrative or legisla-

tive authority, they provide assistance in linking the resources of business and vocational education.

The committees seek to determine work force needs and employment for which training is needed or to be provided. Once training needs are identified, the committees coordinate school programs with education and training programs offered by employers, public agencies, and other schools. To reduce duplication and stretch resources, the committees arrange meetings to establish cooperative relationships between vocational programs and business and industry.

In addition, the committees try to help the schools devise programs that meet the needs of both students and business. They review, evaluate, and update the curriculum, help select and acquire supplies and equipment, and identify resource persons in the business community who can help plan and lay out instructional facilities. The committees also evaluate existing facilities, the adequacy of equipment, and the effectiveness of laboratory layout.

The committees serve a public relations function in promoting and publicizing the vocational education program to the community and to business and industry. They also provide special services to the vocational programs such as making cost studies for specialized needs; establishing student proficiency standards; and supporting student clubs, activities, and awards.

Aiding the School-to-Work Transition

An important function relates to preparing students for employment and helping them make the transition from school to work. The committees plan activities to help students make that transition, as well as developing ideas for student recruitment and helping establish and maintain an effective placement program.

The success of program advisory committees depends greatly on what is discussed, what is accomplished, and what actions are taken at formal meetings during the year. Formal meetings generally discuss such topics as course goals, objectives, and activities; placement; student organizations; community linkage; facilities, equipment, and materials; recruitment; and student development.

COMMITTEE DISCUSSIONS

Student Concerns

As described in the advisory committee guide book, a great deal of the discussions should focus on students—their recruitment, preparation, placement, organization, and general concerns.

Recruitment discussions should concentrate on activities to attract students to vocational programs by the high schools and technical education centers, including alternative ways to attract students. Instructor involvement and student feedback about the recruitment process also are important topics. Committee members should discuss the image of the schools or the centers as it affects student recruitment.

What happens to students once they have been recruited also is an important advisory committee concern. What job-seeking and job-maintenance skills do students need in their preparation for employment? What outside involvement do they need to improve their ability to find and hold jobs? And what are the effective ways to improve the school to work transition?

After the students have been prepared to seek and hold jobs, they need to be placed in actual employment. The committees are urged to discuss such topics as present demands for employment, projections of industrial growth, and community needs to ensure that students are trained for actual jobs. For students who complete vocational training, the committees will find it useful to know how many of those employed were trained in the field and how many are unemployed. This information will help committees advise the schools on future program directions.

What kinds of organizations do students need to prepare them for the world of work? Discussions in this area should emphasize student and instructor involvement, the importance of the organizations, financing the organizations, and upcoming organizational activities.

Of more general concern relating to students are such topics as program leaders, participants in contests, student success stories, accomplishments and awards, arrangement for employment interviews, potential employment, and areas of concerns. These topics help the advisory committees to structure their advice to increase the effectiveness of vocational training programs.

Course Objectives and Activities

To be effective, vocational programs must be relevant to the employment needs and actual job openings in business and industry. The guide stresses the importance of discussing such topics as the relevancy of program offerings, the needs for entry-level employment, employer demands, curriculum updating, needed units of study, program standards, and budgets.

Facilities, Equipment, and Materials

The success of training programs depends on the adequacy of facilities, equipment, and materials used to train students for particular jobs. To effectively advise the schools, the committees should discuss laboratory

management, safety factors and features, alternatives to buying equipment and materials, how to obtain needed equipment, items that might be expendable, cost of equipment, and items that could be done without.

Community Linkage

Vocational education programs will be most effective in providing trained young people for employment if the community is fully involved and informed. Therefore, advisory committees need to look at such areas as community expectations and images of vocational education. The committees should discuss alternative ways to improve the relationship between vocational education and the community, including the need for public relations activities, parental involvement, and promotion of vocational education.

Professional Development

The professional development of instructors and teachers is another important aspect of an effective vocational education program. Important areas for advisory committee discussion include possible workshop activities, potential sites for in-service training, and summer or part-time involvement for instructors and teachers to help make them more aware of employer needs and procedures. Ways to involve the community in professional development activities is also a fruitful topic of discussion.

SUMMARY

Preliminary evidence of South Carolina's efforts to revitalize its vocational education advisory committees and councils shows that improvements have been made. During the 1981–83 and 1982–83 school years, 90 percent of the 231 service or course areas in 16 area vocational centers were judged to be in compliance with the vocational education standard for program advisory committees.

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California's Regional Occupational Programs

David L. Smith and Patricia B. Langlin

Where does vocational training fit in the education of young people? Pressure is on the public schools to return to the basics.

Few question the need for a return to the basics, but that emphasis leaves little room for occupational training in the comprehensive high school and the obtaining of the specialized skills necessary for immediate employment in today's job market.

California's legislature in the early 1960s authorized the establishment of vocational schools designed to serve an entire county. None, however, were established, indicating a widespread reluctance to separate vocational training from the total educational program. Later the legislature amended and added to this legislation several times in an effort to provide greater flexibility in the formation of what are now known as Regional Occupational Centers and/or Programs (ROC/Ps).

The main purpose of ROC/Ps is to provide more opportunities for high quality vocational and technical job training at higher levels regionally than can be provided by the comprehensive high school. ROC/Ps were intended to supply such training without duplicating or supplanting what is already available through existing secondary or postsecondary programs. Although the centers and programs are a part of the K-12 school system, they serve adults and out-of-school youth as well as high school students.

A key to the success of these programs has been their flexibility and responsiveness to ever-changing job markets. Since they are intended by statutes to be involved only in occupational training, the ROC/P's response to industry's needs is critical if students are to receive appropriate state-of-the-art training and to have a high probability of placement upon completion of their course of study. Instructors are well-qualified and possess recent experience in their specific occupation in business and industry.

KINDS OF ORGANIZATION

Regional Occupational Centers/Programs may be formed under one of three different governance structures. Very large districts have the option of forming a single-district ROC/P.

Counties may form an ROC/P to serve those school districts in the county that wish to participate. These programs are operated by the county board of education as a division of the county superintendent of schools office.

A third and more preferred way to form an ROC/P is through the establishment of joint-power agreements covering two or more school districts that wish collectively to offer occupational training opportunities to their constitutents. They maintain their own board of trustees consisting of at least one board member from each of the participating school districts. As members of the ROC/P board, they set the policies for that organization as a separate school entity.

TYPES OF PROGRAMS

Regional occupational programs basically use three configurations: existing on-campus facilities, community classrooms, and cooperative vocational education. Model business, preapprenticeship and apprenticeships, and licensure preparation are also involved.

On-Campus Locations

Californians expect quality vocational/occupational education training programs to be available to high school students. By combining resources of the local school districts and the ROC/Ps, employment training can be made available to all students.

One of the ways ROC/Ps accomplish their mission is through the use of local high school facilities, upgraded with state-of-the-art equipment and supplies paid for by the ROC/P. ROC/P students meet and are trained in this facility. The local high school may use it in the off-hours thus receiving the obvious benefit of the newer upgraded equipment. Often the same teacher will be used by both organizations through contract arrangements between two districts.

Community Classrooms

Industry's support of ROC/Ps has been outstanding. They not only participate in advisory committee meetings during development of the program but continue to serve in an advisory capacity as the programs become operational. In addition, they make their own business sites available for training. Through community classroom agreements with various businesses and industries, instruction takes place in the community with both the credentialed ROC/P instructor and the company's employees contributing to the training needs and experiences of the students.

Not only does the California Education Code address the community classroom issues, but appropriate labor laws were passed so that employees

of the business concerns involved would not be displaced, and so that students at the training sites would not be involved in productive labor.

One of our strongest programs involving the community is the banking program. This course provides training for positions such as teller, customer service representative, and banking proof operator. This program has the support of 14 separate banks with learning stations in 57 different branches. One bank furnishes its facility on Saturdays for the banking proof operator training course. Thus every student has uninterrupted access to all the equipment needed to complete this course.

The arrangement described above is typical of ROC/Ps throughout California and has many advantages for all concerned, because students have the opportunity to train in real situations where they can observe and work with employees actually on the job for which they are being trained. Since equipment is that actually in use, students learn on types of equipment currently used by business in the area.

Students and businesses benefit in other ways as well. Because employers learn a great deal about the students while they are training on site, students are frequently hired when vacancies occur. In fact, a problem with community classrooms is a continuous decline in enrollment resulting from offers of employment by students before their course of study is completed. Obviously, this is a nice problem to have in a job training program.

Cooperative Vocational Education

Comprehensive high schools in California have not been heavily involved in cooperative vocational education (CVE) since the Vocational Education Act eliminated special funding for this activity.

As a natural outgrowth of the community classroom and the on-campus programs, cooperative vocational education has become a viable strategy for ROC/Ps. CVE programs satisfy the need for a paying, productive job experience for students before they leave the classroom and are completely on their own.

The rapport already established in the business community by the ROC/Ps has provided ready access for CVE students. Sites chosen are not the same as those used for community classrooms. Thus, those students going on for this phase of training gain job training experiences with more than one employer.

Model Business

The legislation chartering ROC/Ps permitted the establishment and operation of businesses as long as they are designed for the education or training of the students enrolled in the ROP. Before a business/course can begin

operations, it must receive the approval of appropriate trade associations as well as the county central labor council.

The model business activity provides not only skill training for students but experience with the inventory control, ordering, accounting, and selling phases of a business enterprise. It also provides opportunities for contact with the public as both satisfied and dissatisfied customers.

Through this concept, nursery and floral businesses flourish, service stations and automotive repair shops are operated, restaurants are run, and houses are built for resale.

Preapprenticeship and Apprenticeship

Recently ROC/Ps have been asked to provide training in apprenticeship programs. For several years they have operated preapprenticeship programs, but working with the Joint Apprenticeship Council and the trade associations, this activity has been expanded to include the related and supplemental classroom instruction required of apprentices.

The cost of apprenticeship training is met by special funding provided by the California legislature. Much effort goes into the coordination of all organizations involved.

Licensure Preparation

While the majority of courses offered are short-term (less than a year), it is possible to provide for time enough within the course objectives for students to receive the necessary hours to secure a license. The most common program offered is cosmetology.

Recently there has been involvement in other programs requiring licensing. ROC/Ps have been approved to operate licensed vocational nursing (LVN) programs which require approval and accreditation from several different state agencies.

As students successfully complete these programs and pass the state examinations, the ROC/Ps will probably add other areas such as registered dental assistant.

INDUSTRY INVOLVEMENT

A meaningful partnership between education and business/industry has developed during the past ten years to provide for job skill training for a verified labor market.

Advisory Functions

The success of any occupational program depends to a great extent on the involvement of business and industry people. Their cooperation and assist-

ance help to ensure that there is a job market once training is completed, that objectives of the program will develop the proficiencies required for employment, and that the equipment to be used for training is current. The heavy use of advisory committees is a key factor to the overall success of the program.

Industry representatives devote many hours to provide this needed assistance before new areas are included in the program. They also offer continued advice to keep the curriculum current. Their assistance has been invaluable in suggesting new occupations for which training should be provided because of the changing job market and in advising on areas where training should be curtailed.

Facilities Use and Donations

In addition to the availability of facilities for actual instructional purposes, industry provides tours for classes when they cannot actually accommodate the training section in the community classroom.

Supplies and equipment are donated to the programs by industry. This allows the student to become acquainted with what is actually in use. Industry also donates the time of resource speakers in classrooms and participates in career and job fairs.

Instructors

All instructors in the ROC/Ps have recent actual experience in business and industry as well as credentials as instructors. Not all of these people are full-time teachers; they often continue to work in industry during the day and to teach at night. Advisory committee members help the ROC/Ps identify persons who might be interested in teaching.

Career Guidance

An important component of the program for the high school students is the assistance given to them by career guidance technicians or counselors located on the high school campuses. These individuals are trained to assist the students in making meaningful career choices and to assist in recruiting students to appropriate programs.

Placement services are also provided to students through guidance departments, employment service agencies, and instructors themselves. The instructors' contacts with industry often result in job leads for students.

SPECIAL SERVICES

When classes are located away from the high school campuses, transportation may be necessary to allow the students to participate in the program.

Many ROC/Ps provide transportation for students, using their own buses, the participating district's transportation, or providing bus tickets to students for public transportation.

Advanced high-level programs are only one aspect for which training is provided. Special needs of students are also met whenever possible with program design changes made to meet their abilities. This may mean an adjustment in equipment provided, such as aids for the visually or hearing impaired.

It may also mean a complete change in a job or the tasks of a job for a mentally handicapped student. Special assessment and counseling programs are provided for these pupils so they will be enrolled in programs which offer them the greatest potential for success.

EMPLOYMENT TRAINING PROGRAMS

The state of the economy in California, as in many states during the past two years, has led to a proliferation of employment training programs to try to reduce the high numbers of unemployed caused by plant closures and layoffs and to lessen their effects on retail and service businesses. Also the shift to an economy based on information and service rather than on heavy industry has required a new approach to employment training.

Throughout all these changes, the regional occupational programs in California have continued to retain a high level of credibility not only with business/industry, but also with the legislature and other government agencies trying to address these issues.

State funds have supplemented industry and union training funds to start classes for training displaced auto workers. Unemployment insurance funds also are being made available for training. The ability of Regional Occupational Programs to respond consistently and quickly to ever-changing requirements has led to the provision of new opportunities whenever there is an identified or perceived need for training.

WHY ARE ROC/PS SUCCESSFUL?

For the high school student, ROC/P's offer the best of both worlds. Students may continue to be involved in their local comprehensive high school for their basic program of study and for extracurricular activities. At the same time, they may acquire marketable job skills in preparation for entering the world of work through involvement in the ROC/P program.

For the out-of-school youth, the ROC/Ps offer the opportunity to gain the skills needed to become productive members of society, while encouraging them to re-enroll in the regular high school program if they are interested.

For the adult, the ROC/Ps provide upgrading and retraining opportunities through short-term programs to help them stay current with the changing job market.

For industry, ROC/Ps provide programs flexible enough to meet their needs by establishing and discontinuing programs based on verified labor market analysis. The most important feature here is industry's continued involvement to ensure that people are trained for jobs that exist or for newly emerging occupations that will offer employment within the near future.

For the participating school districts, ROC/Ps serve to extend and expand their programs as well to provide programs that the local high school cannot afford.

For outside agencies, ROC/Ps are not an option to consider when the need for training is identified.

For the state legislature, the ROC/Ps provide an accountable system for delivering employment training, a system whose purpose it has determined through past action and may change and expand through future legislation.

Most programs offered by the ROC/Ps are open entry-open exit. Successful completion depends upon achievement of stated competencies developed through the instruction in coordination with advice from industry.

The placement of graduates after the completion of these training programs is extremely high resulting in a positive impact on the economy and even greater involvement of industry as it recognizes the benefits of reduced training costs for new employees.

Problems? Yes, there are some. But the advantages far outweigh the disadvantages.

Two problem areas that must be addressed are the concerns of the local site administrators regarding control of the students and the concerns of the district teachers regarding possible loss of positions to the ROC/P. Both groups can usually be reassured through a proper orientation and a continuous public relations program with the local districts.

The program's biggest problem has been its success. It has more requests for training and training slots then the state can pay for. The legislature has been faced continually with either limiting the number of students we can accommodate or providing more funding.

The California Regional Occupational Training Program has trained over 500,000 people at an average cost of less than $1,200 per student. Over 60 percent of them have been placed in positions with local companies with good career ladders available.

In addition, current studies indicate the taxes paid by ROC/P completers return to the state the amount invested in their training in about eighteen months after completion.

The ROC/P concept could benefit other states as it has California in an age when decisions are often made that result in students receiving either a "back to basics" approach or vocational education. This program eliminates the need for making this choice; instead it provides the opportunity for students to benefit from both the basic and the vocational training so necessary for the economic survival of this nation.

RECOMMENDATIONS

Since many other states face problems similar to California's, i.e., a changing industrial/economic base, a stated desire on the part of the electorate to substantially reduce taxes, and demand for a "return to the basics," California's alternative vocational/occupational training delivery system as outlined above may well prove to be a viable solution.

We recommend that community, business and industry, government, and particularly legislative support be gained so that training programs are designed to respond to local business and community needs. The basic structure of the programs should include:

1. a governance structure tied to local school districts with elected boards overseeing the operations;
2. training programs that are tied to the local economy with maximum business involvement in a curriculum development;
3. encouragement for instructors and administrators to recycle into their occupations periodically to ensure up-to-date experience and to renew that initial enthusiasm for their chosen field; and
4. maximum use of industry resources, equipment, and personnel to ensure efficient use of ever-declining tax revenues.

CONCLUSION

In the final analysis, the occupational training efforts of the nation must be tailored to the changing needs of business and industry in the local community if the "American Dream" is to continue. The dawn of the "Information Age" provides one more chance for us to free ourselves from the bondages of the past. Americans will accept no less.

Using the Community as a Resource

Cecil L. Groves

The use of the community as a resource requires a new pattern of thinking about how to deliver instruction and cause learning. Traditionally, college people have thought in terms of faculty- and site-driven instruction, autonomy in decision making, avoiding entangling alliances, and fear of relationships with proprietary interests which might contaminate learning. These are good precepts if adequate faculties, facilities, and finances are available to a college. In the halcyon days of the 1960s and 1970s, this approach seemed appropriate.

Austin (Texas) Community College (ACC) lacked these luxuries. It grew up with a different way of looking at things. ACC's administration and faculty learned early that service would be possible only by using the community's resources. Fortunately, this view was shared by all.

ACC's operational principles are a mix of the puritanical concepts of "make do or go without," the pioneer spirit of "helping your neighbor," and the management concept of "positive-sum gain." Into this management stew we mix opportunism and pragmatism with a healthy expectation of success to create a fertile soil for a community-based college.

THE CLIMATE FOR COMMUNITY COOPERATION

Because of budget constraints and a great student demand for a broad range of technical programs, ACC had to aggressively seek cooperative agreements with other community agencies to develop more dynamic educational programs than any one agency could have developed on its own. When ACC was established in 1973, its administration began using community resources and making cooperative agreements to multiply the impact of scarce dollars.

Ten years later, ACC had an active Industrial Advisory Committee, energetic support from local industry, and an array of cooperative efforts with high-technology firms. This chapter will describe programs and efforts that use local funding rather than federal or state support and the strategy used in forming successful alliances with business and industry.

ACC, because it has no local tax support, was required from the beginning to plan methods of delivering instruction and support services differ-

ently from most institutions. ACC's first Board of Trustees envisioned a college which would use existing community resources for the delivery of instruction. Members of the founding board were extremely optimistic and visionary. They expressed the hope of reaching "every household in Travis County," where there are more than 160,000 households.

Overcoming Limitations

The college faced staggering limitations. For example, the college does not own any facilities or real estate. It operates without a local tax base. Its operating budget is approximately 15 percent less than other colleges in Texas that have tax bases. Also, none of the leased space used for instruction was designed for the college. Funding limitations forced ACC to rely on a large part-time faculty to provide instruction.

Today, ACC teaches in more than 60 different locations, including full-time instruction in two abandoned public school buildings (30 and 70 years old), leases administrative space downtown, with cooperation from the City of Austin occupies abandoned nursing quarters for allied health programs, and uses independent school district campuses in the county for evening instruction. Overcoming restraints, ACC's enrollment has climbed from 1,800 credit students in 1973 to more than 15,000 credit students in spring 1983 with another 6,000–8,000 non-credit students enrolled.

Quality and Variety

The students (approximately 22,000 in spring 1983) are enrolled in an array of educational programs covering most of the academic areas at the freshman and sophomore level and in nearly 60 occupational degree or certificate programs. Despite its phenomenol growth, ACC has one of the finest educational programs in the state. Students who graduate and take competitive exams consistently score the highest, or among the highest, in the state of Texas.

Independent observers recognize the college's exemplary health sciences program (ten degree programs), strengthened by possibly the most complete public community college health sciences library in the South. ACC leases an outstanding instructional television studio and is a national leader in the instructional application of telecommunications. In the area of drafting, the college uses the most sophisticated computer-assisted electronic drafting equipment. It also has exceptional programs to support local business and industry in high technology areas such as quality assurance/quality control, chemical technology, and industrial technology and robotics. ACC faculty are nationally recognized in their fields, holding many positions of respect and honor in their associations, and are frequent publishers of books and periodicals.

BEGINNING OF COOPERATION

ACC was created with an expectation that it would seek alliances with other organizations and agencies to provide education for its constituents. Federal and state funds were sought to underwrite vocational/technical instruction, but they were not sufficient.

A partnership to provide nursing education was one of several important community-based approaches to learning which proved successful. Beginning in 1974, ACC entered into a far-reaching agreement with the City of Austin, assuming instructional responsibilities of the public hospital-based diploma nursing program. This city-funded hospital diploma nursing program had operated since 1915. The city was willing to provide the college, without charge, facilities (approximately 20,000 square feet), equipment, and access to a major health sciences library, if the college would assume responsibility for the program.

The college, in turn, employed the faculty and staff of the program, initiated a tuition and fee charge for the program, and sought state funding through the Coordinating Board, Texas College and University System, to support the first two years of a three-year program. The city assumed financial responsibility for the third year.

This merger of educational need on the part of the city with the college's ability to provide postsecondary education at the technical level succeeded from the beginning. The program began to grow. Since 1974, nine degree and certificate programs have been added, including Licensed Vocational Nursing, Radiologic Technology, Long-Term Health Care Administration, Occupational Therapist Assisting, Physical Therapist Assisting, Surgical Technology, Medical Laboratory Technology, and Paramedic Technology.

Health Sciences Program

The City Council donated the health sciences library to the college in 1979. The $300,000 collection of books and materials is the key medical library for the Central Texas medical community. In the summer of 1982, the City of Austin opened the abandoned surgical wing of the hospital—some 15,000 square feet of laboratory facilities—for surgical technology, radiologic technology, and medical laboratory programs.

For a modest $12,000, the college renovated these facilities to provide students with superb laboratory facilities. Given existing equipment in the surgical suite, the college now has three energized x-ray units, a full service medical laboratory area, and two full surgical suites for students in surgical technology. Because of the city's willingness to actively participate in this joint partnership effort, the college is able to supply the city with one of the most comprehensive allied health programs in the state.

This early and successful joint venture encouraged additional cooperative efforts.

COLLABORATION WITH INDUSTRY

From the college's beginning, local business provided intern opportunities for students in midmanagement programs. As a result, enrollment in the midmanagement program expanded rapidly. Many employers encouraged employees to acquire college credit for promotion. One large business, the Austin American-Statesman, enrolled most of its circulation department employees in the program and provided instructional space as well as financial support for the program.

In 1975, the American Institute of Banking (AIB) asked ACC to take over the AIB instructional program. The institute agreed to provide not only instructors, but also space for the program in their various banks. More than 60 banks now participate in this program with a fall semester enrollment exceeding 500 students. While such a relationship is not unique, it provides ACC with supportive relationships which open doors for other short-term training programs for clerical staff and others.

Also, in 1977, ACC joined with the Texas Education Agency and the Texas Industrial Commission to pioneer the first industrial start-up program in the state of Texas. The purpose of this program is to attract new industry to the Austin area and Texas by providing start-up training for new employees and a system of ongoing training to upgrade employee skills for plant expansions. This program's first client was Westinghouse Corporation. Persons were trained for work on heavy industrial motors and generators. The program's success led to start-up programs with Advanced Micro Devices (electronic components), B. J. Hughes (oil field equipment), Carbomedics (artificial heart valves and other biomedical devices), Lockheed Missiles and Space Corp. (defense-related equipment), Abbottt Laboratories (sterile hospital solutions in flexible plastic containers), and Tellabs (electrical components).

Joint Planning Efforts

The industrial start-up programs were planned jointly by the college and the sponsoring industry to meet industry's specific objectives. The college supplied technical instructors; however, sometimes the best instructors were the company's own trained experts. In those cases, ACC acted as outside agent, purchasing the services of the company's skilled staff and returning them to their usual departments after new production workers were trained. In all cases, the college supervised the instructional activities and designed the curriculum. This effort to "customize" the educational

program for industry led to the development of a four-part program for designing training programs for industry.

These four parts are:

- work preparation (orientation, prevocational training);
- specialized job training (industrial start-up, adult vocational training, occupational education courses);
- employee development (academic and occupational education courses); and
- professional development (workshops, seminars, conferences).

FOCUS ON HIGH TECHNOLOGY

By the summer of 1980, it was evident that to meet the needs of business and industry the college must establish ongoing communication with different employer groups and organizationally consolidate its services. Also, the explosion of high technology in the Central Texas area caused concern that ACC would be unable to effectively train employees, given its equipment and facility limitations.

Austin had become the "Silicon Valley" of Texas. Electronics firms were relocating here in large numbers, including such well-known corporations as IBM, Motorola, Tandem Computers, Advanced Micro Devices, Data General, and Texas Instruments, to mention a few. Added to the electronics group was the influx of medically-related high technology firms, including Carbomedics, McNeil Labs, and Abbott Laboratories. A survey of industry in Austin in 1980 revealed that some 30 firms each employed more than 250 people and that these should be the target group for the college's initial work.

How could the college establish an effective dialogue with high technology firms to determine which degree programs, short courses, seminars, and other activities should be established to create an acceptable labor pool and to upgrade training of those already employed? While college personnel met individually with some industries on a regular basis, there was no collective input.

The college invited personnel and training representatives of the 30 large industries to a meeting on September 16, 1980. Thirty-one persons attended. Based on industry information, the college established the Office of Business, Industry, and Government Training Programs under the Community Campus. The Community Campus is responsible for all noncredit vocational and avocational offerings throughout the institution. Among its responsibilities are Adult Basic Education (4,000 students), adult vocational offerings (8,000 students annually), the Institute for Lifetime Learn-

ing (senior citizens—2,000 students annually), and numerous avocational courses.

The Industrial Advisory Committee's Work

Since the first meeting, the Industrial Advisory Committee has met quarterly. Attendance at the meetings has ranged from the initial 31 persons to more than 100. The average attendance is approximately 70. The 30 initial industries plus others are represented at each meeting along with persons from the Governor's Office, Texas Education Agency, Texas Industrial Commission, Coordinating Board for higher education, the press, and other interested organizations. Meetings are now by invitation only.

Program presenters have included the commissioner of education, the executive assistant to the governor for budget planning, and representatives from industry. Other programs have involved tours of plants, including those of Advanced Micro Devices and Motorola. The meetings usually last from two to three hours and include lunch. Each industry will send from one to three persons, typically from the personnel and training areas; however, plant managers as well as corporate officers will attend.

Each program includes a five-to-ten minute college presentation reviewing its programs for industry and requesting advice from company representatives. Some of the direct results of this advisory committee have been scheduling of college-credit courses at plant sites; preregistration and advising at plant sites; establishing a Career Assessment Center to provide assessment for credit of industry-based training programs and to provide a comprehensive testing/assessment center; establishing an adult basic education program and English-as-a-second language program at industrial-based sites; creating a high technology training center; and circulating the *Resource Quarterly*, a journal published by the college for local industries.

The *Resource Quarterly* discusses areas of employment training and industrial development, as well as economic trends. The *Quarterly* is mailed to more than 2,500 businesses, industries, and interested persons in the Austin area.

Other Committee Accomplishments

The committee also implemented a telecommunication system for multi-site, interactive audio and video training and established curriculums for a quality assurance/quality control degree and a chemical technology degree. In addition, the committee received help from industry to create a machinist program, focusing on industrial technology equipment repair and to establish instructional television programming by cable for teaching electronics (AC/DC circuits and magnetism).

Since 1980, with the help of the committee, the college has become a partner with industry in planning educational goals. ACC serves as a communication link and a vehicle to facilitate information flow among different corporate entities. This has greatly enhanced the status of the college and permitted faculty and staff to interact on a daily basis with industrial leaders. Through this interaction, college faculty and staff have gained in-depth insight into the needs of business and industry, and thus can be more helpful to students.

EXAMPLES OF SUCCESS

The "open-door" benefits of the Industrial Advisory Committee began to pay off in a significant way 18 months after its creation. Employing a strategy of ongoing communication, active participation, responsiveness, and emphasis on quality, the college developed the kind of trust and confidence with industry that resulted in the opening of industrial facilities to all students, not just employees. The use of space and industrial equipment provided free to the college is far beyond the financial and facility capacities of most colleges.

While ACC for several years has had working arrangements with local industries for training *employees* of those industries on-site, only recently, with the help of the Industrial Advisory Committee, four industries have opened their doors to *all college students*, giving ACC students access to sophisticated equipment.

Bausch & Lomb. In January 1982, Bausch & Lomb, a Fortune 500 company known for its manufacturing of optical lenses, opened its doors to ACC students four nights a week. Since that time more than 120 college students have received training in electronic computerized drafting. Bausch & Lomb made available to the college its latest computer graphics system, the PROducer, which was developed as an electronic tool that a drafter can use to replace traditional drafting tools—scales, templates, rub-ons, letter guides and even the drafting table. These systems, valued from $50,000–$100,000 each, are available to students from 5:30 to 9 p.m. This equipment and space are available to the college at no cost. Because of this cooperative effort, ACC students are on the ground floor of five different systems of drafting tools which promise to revolutionize the entire drafting function.

Lockheed Missiles and Space Co. Following the success of the Industrial Advisory Committee and the Bausch & Lomb effort, assistance came from Lockheed Missiles and Space Co. in developing a degree program in

quality assurance/quality control. Lockheed, at its expense, flew in educational engineering consultants who planned with the college personnel the state-of-the-art quality assurance program. Recognizing the institution's limited facilities, Lockheed also opened its corporate doors for college students to take classes in its newly leased facilities and permitted students to use Lockheed equipment. Lockheed also provided instructors for courses ranging from data processing to business management. For example, the vice president for operations is one of the college's faculty members.

International Business Machines. Another of the cooperative efforts with industry is a contract with IBM to use IBM's donated equipment and leased space to provide an industrial service technician program for persons who will work on automated equipment systems. This new area of technical training focuses on equipment repair and requires knowledge of pneumatics, hydraulics, electromechanical devices, and robotics. IBM has assumed a major commitment to this program which involves daily contact and interaction with the college faculty and staff as well as continuing assessment of student progress. Nine months were spent designing the program before implementation in the summer of 1982. Not only does the college train IBM employees, but the center, with IBM's encouragement, will be open to other students. More than a million dollars worth of equipment is available in the center.

Data General. Finally, in February 1983, Data General gave the college a minicomputer system valued at $82,000 for teaching computer repair and troubleshooting. The corporation also provided a seven-week training program for faculty in all aspects of computer repair and troubleshooting. Data General provided access to its latest software applications to simulate microprocessor applications so that students can solve diagnostic problems characteristic in a variety of industry processors.

Benefits to Industry

The benefits of these cooperative programs to the college are obvious. Considerable benefits also accrue to industry. It does little good to invest in computers, numerically controlled machines, tools, and other complicated devices unless the skilled work force is available to operate and maintain them.

Unskilled and untrained workers operating expensive equipment in today's high technology era could result in tremendous financial losses, damages, accidents, and downtime. College friends in industry say that they see training and education as a means to solve problems in employee turnover and growth.

SOME CONCLUDING THOUCHTS

Whatever success Austin Community College may be perceived to have accomplished results from an understanding that work and education are not mutually exclusive enterprises. Today, education and work are inextricably linked in such a way that lifelong learning is a necessary reality for those in the work force. Rapid technological change and the information explosion demands that no matter what a person's level of education or training continued education is required. This reality is well understood in the high technology, electronic, and medical manufacturing industries. Thus, the college found it easy to work out cooperative arrangements in establishing programs, sharing concerns, and developing training outlines for the future.

VICA and the United States Skill Olympics

Larry W. Johnson

Through a partnership among American industrial management, organized labor, and education, the Vocational Industrial Clubs of America (VICA) is able to amass equipment, tools, supplies, dollars, executive time, talent, and technical expertise valued at over $6 million to produce the United States Skill Olympics (USSO).

This incredible accomplishment is the result of unparalleled collaboration. In less than 15 years, VICA has established its reputation within the worlds of management and labor and entered into full partnerships with them.

VICA is the national organization for students enrolled in trade, industrial, technical, and health occupations programs in the public high schools, area vocational schools, community and junior colleges, and other public postsecondary institutions. VICA emphasizes respect for the dignity of work, high standards in trade ethics, excellence in skill, scholarship, and safety. VICA promotes understanding of the free enterprise system and encourages development of patriotism through the practice of democracy within the club. The VICA program is an integral part of the curriculum and is intended to be used as a tool for teaching by the instructor.

A SHOWCASE FOR VOCATIONAL EDUCATION

The USSO is an annual event that provides vocational students an opportunity to gain recognition for their skills comparable to that received by students participating in athletics and other school activities. First held in 1968, the USSO now encompasses 38 occupational and leadership skill contests. It is held in conjunction with the annual national VICA conference where student delegates elect their officers and determine the direction of their organization.

More than 2,500 vocational students come as contestants from all over the United States, after having won first place in their home state contests. There are secondary and postsecondary levels in the competition; students compete in skills such as drafting, machining, industrial electronics, carpentry, auto mechanics, cabinetmaking, commercial art, house wiring, bricklaying, cosmetology, job interview, and welding. Winners receive

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recognition from VICA in the form of gold, silver, and bronze medallions. Representatives from labor and management, along with educators from the state hosting the conference, help VICA as U.S. Skill Olympics contest organizers by providing contest materials, tools, equipment, judges, and special awards for some contests.

How It All Comes Together

The VICA organization believes that vocational skill training is but one part in the development of a motivated and productive employee. The student must become a whole person—one skilled in the trade, as a matter of course, but also one able to communicate with and serve the community as a thinking, contributing citizen. It is the production of these kinds of potential employees that makes VICA of particular interest to industry.

At the same time, those segments of labor and management concerned with developing a labor force must provide information to vocational educators to ensure that programs of instruction meet the actual needs of industry. The Skill Olympics provides a neutral forum for manufacturer and educator to meet and identify the real needs in the field, and to define how educational programs can be developed, revised, and directed to meet those needs.

Involvement of Industry

Involvement in the Skill Olympics gives industry an opportunity to evaluate the product of vocational education: trained workers. Often, business discovers that vocational education can do a better job of training than employers think.

One major firm, which helped establish the electronics contest, found it had a prejudiced view of secondary versus postsecondary vocational graduates, which had resulted in a wage differential. Both groups performed at a similar high level of competency in the competitive event, and the wage scales were adjusted to eliminate the inequity.

In another case, a technical expert from a contributing company developed a project for an event. Much to the company's surprise, the project was much too simple for the caliber of student entering the competition. A new project was developed in time for the national contest, and a major company was sold on vocational education.

An added opportunity afforded industry through partnership with VICA is the exposure of hundreds of technical and industrial teachers to the latest state-of-the-art in their field. Debriefing sessions and seminars are held after each contest. Teachers can discover the intricacies of the contest, learn the reasons behind the inclusion of each part of the project, and become updated in the latest technology and methods. Taking this informa-

tion back to the classroom does much to close the gap between what vocational education offers and what industry must have in terms of trained employees.

THE ROAD TO PARTNERSHIP

Among the Skill Olympics' most active and ardent supporters are labor and management representatives who serve on the technical committees. A technical committee is a group of technical experts from industry who develop the contest within each occupational area. They determine performance objectives, design the projects, and secure judges from labor and management. They assume responsibility for the operation of the contest, which includes providing equipment and supplies and devising floor plans for work areas.

As they develop the contests, the committees strive to include a wide variety of skills which might be expected for entry-level job requirements, rather than gearing the event to what is taught in particular programs. This gives the Olympics integrity as far as American industry is concerned.

Students may be introduced to equipment they have never seen before or to new areas of skill. The guiding rule is: if it is expected in an entry-level job today, it can be included. This is a departure from a policy that said, "Be fair. Test what they are learning." A national competition that did not test current entry-level skill requirements would be useless. Rather, educators are challenged to introduce state-of-the-art methods and technologies into the classroom to stay close to the cutting edge of job competition. This is in keeping with the ultimate goal of every vocational program—to prepare students for gainful employment in American business and industry.

Individuals who serve on technical committees support the Skill Olympics in the interests of upgrading the image of America's vocational student; attracting and challenging trainees in vocational programs; providing industry with highly trained, motivated workers who are also responsible citizens and leaders; and upgrading instructional programs by bringing teachers, students and industry closer together in a more productive relationship.

Support of Industry and Labor

Top executives from many of the nearly 250 corporations that help VICA attend the Skill Olympics to emphasize their support of this program which strengthens communications between education and industry.

Participating manufacturers, equipment users, and allied trade associations perform a valuable service by making equipment available for the contests. For example, Mack Trucks, Inc., Go-Power Corporation, Ken-

worth Truck Company, and others make available a large number of truck tractors, dynamometers, motors, and parts for all types of dieselized equipment. Top service personnel from manufacturers such as Cummins Engine Company, Dana Corporation, and Eaton Corporation volunteer their time to supervise the competition, help in the strenuous and rugged setting up of the individual projects, and judge the contest itself.

USSO supporters also include major companies such as Alcoa, IBM, General Motors, AM Multigraphics, Briggs & Stratton, Clairol, Inc., J. C. Penney, Caterpillar Tractor Company, and Bruning, plus labor unions, such as the International Brotherhood of Electrical Workers, International Union of Bricklayers and Allied Craftsmen, and the Graphic Arts International Union.

Other supporters include trade and professional associations such as the National Association of Home Builders, the Electronic Industries Association, the National Machine Tool Builders Association, the Automotive Parts and Accessories Associations, and the American Dental Association.

Gifts and Contributions

The value of the tools, equipments, supplies, and personnel hours needed for the Skill Olympics exceeds $6 million. Of this amount, some $4 million accounts for the dollar value of equipment and supplies, while the balance of over $2 million represents the value of time spent by more than 200 technical committee members, over 400 teachers, and more than 500 contest judges from labor and industry.

Labor and management are directly involved in the Skill Olympics program in other ways. General Motors Corporation, for example, furnishes travel scholarships that cover all the costs for more then 70 auto mechanics students and their instructors to attend the conference. Mack Trucks, Inc., does the same for diesel mechanics students and their instructors.

Organizations and companies such as the Brick Institute of America and E. I. duPont deNemours and Co., Inc., help defray the cost of sending local winners to state and national contests. A number of companies—A. B. Dick, Martin Senour, and E. I. duPont deNemours and Co., Inc.—provide technical instruction and expense-paid training programs and industrial tours for contest winners.

The Design Schools offer the high school and postsecondary first-place winners in the commercial art contest a two-year full tuition scholarship to one of four nationally-known art schools. Companies, associations, and unions also donate tools and textbooks as special awards for contest winners.

STRATEGIES AIMED AT SUCCESS

Ideally, a partnership is formed from the very top of an organization, from which the commitment filters downward through all levels. Many of VICA's successful relationships with management and labor are structured this way. A chief executive officer (CEO) who is sold on VICA and on the Skill Olympics makes a powerful salesman when he or she meets other CEOs.

Contacts with industry have been established through participation in the Skill Olympics. Those contacts continue to be a prime source of entry into industry. Enthusiastic supporters of the event take home news of their involvement, and VICA supplies photos and news stories to trade and association publications.

Invitations to attend the Skill Olympics go to a large number of top industrial and technical company executives. There are few persons who see the actual event who can go away without a positive attitude toward vocational education because they see the end product: students preparing for the world of work.

Bright and articulate student officers conduct a "Goodwill Tour" to corporate and union headquarters each year. The exposure of top executives to these enthusiastic and poised VICA people, who are proud of vocational education and eager to go to work, is impressive and serves to interest business in VICA and the Skill Olympics. Students are never used in a fund-raising capacity, but rather as "door openers."

Seeking Collaboration

When VICA staff members secure an appointment with a high-level business executive, they approach the meeting well-prepared. Over the years, VICA has found that a straightforward style works best. The presentation might run something like this:

"We want to invite you to become involved with a great group of young people who want to become professionals in their occupational skills, and who have the extra edge in leadership and citizenship skills. These kids are 'America's new professionals' and their attitudes toward work and their trade makes them the kind of employee you'd be happy to hire.

"We have a program which includes nearly 300,000 students and 15,000 teachers all over this nation. VICA needs your help to continue its success. We would like your involvement at the local, state, and national levels, and particularly with the Skill Olympics. We need your company's technical expertise and other resources. This means X number of dollars, X number of days to serve on a technical committee, and/or X amount of a

professional expert's time to serve as a judge for a competitive event. This is what we need; what can you do to help us?

"In return, you will have an opportunity to have a direct impact on training our nation's work force. You will have input into the curriculum of vocational education, so that students will be trained more closely to your industry's specification. You will be able to introduce your equipment, tools, and supplies directly to thousands of vocational students and teachers. Your state-of-the-art technology can be introduced directly into the classroom. Most importantly, you will have the satisfaction of helping our nation's youth become the skilled work force of tomorrow."

VICA goes equipped with a list of specific needs. The keys lie with personal involvement and attraction on the basis of interest, combined with a personal invitation to do a specific job in the executive's own area of interest.

BARRIERS TO COLLABORATION

As in any partnership, communication is the factor that makes or breaks it. VICA finds that industry may lack understanding of why vocational education operates as it does. People who work in a climate of instant reaction to changes in policy or method have trouble handling a bureaucratic system.

Certain companies have specific policies set by their boards of directors which make some kinds of involvement with VICA impossible. For example, sometimes management and labor representatives cannot sit on the same committee because of labor laws. In one case, representatives from competitive companies were not permitted to meet on any committees, because of a suit involving price-fixing. These companies limit their assistance to contributions of money, speakers, and equipment.

Use of company products can become a barrier. Of course, companies receive visibility through the presence of their equipment, but the use of donated supplies must be handled ethically and in good taste. The technical committee makes the decisions regarding use of products, and no company may use VICA students in advertising that in any way might be construed as an endorsement.

Awards can become a barrier. All awards must be related directly to the winner's occupational areas. These include training trips, scholarships, tools, and books. No cash awards are allowed. The problem may arise is a company wishes to donate an award that falls outside the accepted limit. The industry representative presenting the award receives visibility and a certain amount of publicity in trade publications.

A serious barrier to success in developing partnerships with labor and management is a lack of resources. Adequate staff, funds for travel expenses, access to various types of media, and other resources are required to be successful. VICA allocates nearly $500,000 from its resources for the national conference and competitive events. These funds cover staff salaries, conference activities, building rental, travel, and other technical arrangements.

KEYS TO SUCCESSFUL PARTNERSHIPS

Learn how to relate to industry, both labor and management, on a long-term basis. Take time to learn the protocol within the companies and organizations. Establish a common bond from which to begin. Cultivate a friend within the company who understands the purpose of the relationship, and who can give credibility and integrity to your cause.

Go with a positive attitude. Organize thoughts, goals, objectives, and requests in advance. Be prepared with a list of needs, and be ready to be flexible.

Ask for help in whatever area it's needed, such as assistance in securing publicity. Anticipate as many questions as possible and be prepared to answer them candidly and concisely.

Be aware of potential barriers to participation and learn how to address them. Consider the timing when requesting help: When are budgets set? Is the company undergoing a reorganization? Cooperate during times of economic upheaval.

Convince industry that only through their help can they be assured of a well-trained and motivated work force for the future.

Community Work-Education Councils

Gerard G. Gold

Community work-education councils are one form that collaboration has taken between business and industry, labor, and education, including vocational education. These councils seek to bring together the education, business, labor, and other sectors in collaborative relationships that are aimed at benefiting both business and education. More than 150 collaborative councils now exist around the nation. A brief description of four of those councils follows.

FOUR COLLABORATIVE EFFORTS

A Rural Council

In the rural-industrial heartland of south central New York State, the Career Development Council, Inc., serves a tri-county area centered on the small city of Corning. The council, formed in 1975, and incorporated in 1977, has forged a reputation as a trustworthy, high-quality source of information, contacts, and programs on all aspects of career development for youth and, more recently, for adults.

To do their job, council members and staff keep on top of and participate in the region's economic development thinking. Sensitive to new manufacturing trends, the council plays an active role in efforts to prepare the region for its future in a mixed economy of manufacturing, high-technology research, agriculture, tourism, and information processing.

Over the years, the council staff has learned that its work in arranging classroom speakers and student shadow visits to employers is the "lifeline" of visibility and respect. This work creates contacts and leads to more opportunities for community leadership, including teacher in-service workshops, grant preparation for local school districts, brokering special training programs for employers, and developing labor-management-education collaborative programs to aid at-risk manufacturing workers.

An Urban-Suburban Council

The Arizona Business-Industry-Education Council (ABIEC), established in 1960, is one of the oldest and most widely recognized collaborative

councils. It serves students, teachers, and school counselors in the Phoenix area and statewide with a wide range of career education and free enterprise awareness activities. ABIEC facilitates interactions between education and business, and it catalyzes increased cooperation between those two sectors and area civic, service, labor, legislative, and professional organizations.

In 1981–82, ABIEC programs reached 5,400 students, 680 teachers and counselors, 155 school administrators, and 430 business leaders. The council's annual Free Enterprise Institute attracted 115 high school juniors from 53 Arizona high schools to meet with top business leaders in a four-day, give-and-take analysis of relationships between economics, politics, and social systems. An active board of directors and, since 1978, a dedicated paid staff have given ABIEC a reputation for sustained service. In 1983, the council began to apply its skills to the career development needs of adults by brokering program relationships between employers and colleges in the Maricopa Community College District.

The Washington, D.C., Council

The Metropolitan Washington Work-Education Council was started in 1981 in the national capital area by a public agency serving a consortium of regional jurisdictions. The Metropolitan Washington Council of Governments, recognizing widespread concern about youth unemployment, worked carefully to convene a group representative of school districts, business, labor, public employment and training agencies, and community-based organizations.

In cooperation with the District of Columbia Public Schools, the council developed a project for a centralized career placement center for District of Columbia youth. The design for the center includes coordination of placement activities with the school system and with business and industry. The Council will continue to advise, monitor, and assess center operations.

The council's facilitator-broker role is also evident in a project which surveyed public and private employment training programs for youth. The council's directory of such programs, the first produced on an areawide basis, is a valuable career planning and placement resource for many organizations. During 1983-84, the council will initiate a series of activities designed to increase communication, information, and collaborative action among agencies that need to link education and training to the region's high-technology economic development efforts.

A Statewide Council of Councils

In California, the blue-ribbon membership of the Industry Education Council of California (IECC) in Burlingame oversees a network of 20 local industry-education councils and a variety of IECC-initiated projects, most

of them implemented through the local councils. Among its activities, the IECC arranged for loaned executives to help with magnet school implementation. It also acts as a state-level resource broker for a model project that coordinates multi-agency education and training services for the handicapped in one of the local communities.

Councils in San Mateo and Contra Costa counties are now extending their work on youth transition problems to involve employers, community colleges, unions, and community agencies to find remedies to the diverse work-learning needs faced by older workers and new employees.

THE CLIMATE FOR COLLABORATION

The energies of community leaders are turning once again to the learning and work needs of young people and adults. Sometimes with financial support from outside the community, but more frequently energized by a seriously felt desire to help improve their communities, these leaders are making themselves felt in local education programs and practices. Their efforts include more active participation on advisory committees and school boards; more active volunteer participation on program review task forces; more leadership in cooperation with vocational training, career awareness, internship, and placement programs; and leadership in financing local innovative programs.

In some communities, as the examples above indicate, community leaders have found it useful to create small formal organizations generically known as collaborative councils.

Fostering Collaboration

Local collaborative councils, which bring together leaders from business, labor, government, and education, deserve special attention, because they are demonstrating anew the community-level leadership that is essential to create and establish a new national concensus about the purposes and functions of education institutions generally and public secondary schools most particularly.

In addition, local councils deserve attention because many of them are also looking at the purposes, functions, and capabilities of other community education, training, and employment institutions. These councils are beginning to help their communities sort out the various needs, resources, and responsibilities related to the broad education and preparation of young people and adults for work and citizenship. In so doing, they necessarily touch on the ways schools, employers, unions, universities, government, and community organizations of many types work together on many different education and training problems. But collaborative councils and indus-

try-education-labor collaboration generally are still pioneer activities without well-established structures. As investments in human resources gain a stature equivalent to investments in technology, innovations such as the councils are moving from the periphery toward center stage of corporate, union, and education concerns.

Today, well over 150 independent collaborative councils are functioning in urban, suburban, and rural communities across the nation. A few operate as statewide councils. Just five years ago few of these organizations would have existed. That they exist now is a tangible sign of a new wave of enthusiasm for business and labor cooperation and alliances with education institutions throughout the nation.

Atmosphere for Collaboration

Yet there is a noticeable ebb and flow of council activism even within these few years. Being locally initiated, they are very sensitive to changes in leadership and funding. Perhaps more to the point, the same felt needs that stimulated innovative leaders to create local collaborative councils have also stimulated corrective actions by institutions themselves. In the late 1970s and early 1980s, federal and state education and training legislation has created programs (such as career education) and mechanisms (such as Private Industry Councils) which derive from similar motivations. Most impressive are those communities where the growing complexity of the education-work "scene" has increased the desire of leaders for a "neutral turf" where issues can be raised and collaborative solutions designed.

A Question of Motivation

The emphasis is on institutional responsibility. Mindful that institutions are only as motivated as the individuals who represent them, council organizers also recognize that motivated institutional leaders carry far more influence and promise of sustained impact than if they act as individuals. In contrast, students and parents—historically not perceived as powerful community leaders—are accorded more attention as beneficiaries and clients than as leading actors.

Advocates of collaborative councils place their hopes in local "movers and shakers." But, who will hold these people accountable? Here the assumption seems to be that pluralism of interest and leader-constituent relationships within American communities are sufficiently vital to permit collaboration without collusion, without real danger to the integrity of education and work institutions. The validity of this assumption must be the central question being tested by the collaborative movement of the 1980s.

WHAT IS A LOCAL COLLABORATIVE COUNCIL?

Collaborative councils usually are identified as either "Industry-Education-Labor Councils" (and "Industry-Education Councils") or "Work-Education Councils" (and "Education-Work Councils"). Local names vary from community to community. Community Action Council for Career Education, Consortium of Vocational Educators and Employers, Tri-Lateral Council for Quality Education, and Association of Business, Labor and Education are but a few of the names that collaborative councils go by. Some of the private industry councils (PICs), initiated through federal legislation, have also taken on the collaborative council's characteristic autonomy and involvement in education as well as work-related issues.

Collaborative councils can be distinguished by a few criteria. These are general characteristics and fit better in some cases than in others:

- Council membership is *representative* of major sectors in a community. Collaborative mechanisms are intended to join and serve the interest of *more than two sectors*.
  Councils should be designed to treat education, industry/business, labor, government, and youth service institutions as equal partners. In local practice, the interest and strength of one or two sectors may predominate, but the goal of collaborative councils is to seek a balance of multiple purposes rather than exclu-
- Collaborative councils are essentially *self-organized*. Initial sponsorship may come from one sector or even a single organization. But once organized, the council is responsible for its own continuity. Neither membership nor agenda is assigned to the collaborative partners by a single institution.
- Collaborative councils are *performance-oriented*. Members and staff develop their own agenda and approaches to community needs. While such councils may choose to play advisory roles in specific instances, they are designed to perform a variety of roles ranging from fact-finding to project operation, to program development, to program brokering, to catalyzing.
- Most crucially, council members and the institutions they represent *share responsibility* for implementing the action agenda which brought them together in the first place. Members exercise active *leadership* within their primary constituencies and with other sectors and constituencies. Collaboration implies a recognition of *shared self-interests* that leads to mutual action.
- Organizational activity is sustained through *formal council organization*, with assistance from a *staff* director or coordinator.

Agenda Issues

The issues on the agenda of collaborative councils run the gamut from policy to program to process. The agenda items may address the functions, attitudes, behaviors, and capabilities of schools, colleges, employers, labor unions, government agencies, and religious and social services institutions. Typically a council agenda deals with problems which can only be resolved through the involvement of two or more of these institutions.

For example, some collaborative councils have exhibited leadership in linking economic and human development. As employers and unions begin to examine the workplace of the future, they may be troubled by the perceived status of employee and member skills and motivation at all levels of the work force, whether management or workers. Trying to cope with workplace requirements, employers and unions are drawn progressively further into analysis of the causes of success and failure in career preparation. Collaborative councils are neutral "turfs" where these leaders and their education counterparts can discuss and act on needs, resources, and strategies in positive ways.

Funding the Councils

Most councils operate on modest budgets. The principal costs depend on whether there is paid staff and whether the council seeks project operation responsibilities requiring additional staff. Budgets of $40,000 to $100,000 are typical of councils with paid staff. Budgets of $2,000 to $3,000 are typical of councils which rely entirely on members for coordination, outreach, and in-kind support. As councils become more active, and as their independent, broker role in the community becomes more significant, a core of paid staff tends to be indispensable. Councils must then develop cash or equivalent donated staff services to support their efforts.

Growth of the Council Concept

During 1979–82, with sponsorship from the Office of Vocational and Adult Education of the U.S. Department of Education, the National Institute for Work and Learning (NIWL) gathered and analyzed information from collaborative councils across the nation. Findings are summarized in *Industry-Education-Labor Collaboration: A Directory of Collaborative Councils*.

While the earliest collaborative council dates back to 1947, a council movement is a phenomenon of the late 1970s. Of the 155 local councils reviewed by NIWL, 120 were formed since 1975. The earliest councils were created primarily at local business initiative to communicate a business perspective on economic issues to students and teachers. A second small group was formed following Sputnik to help schools develop career

awareness activities with local industries. A third group developed in the late 1960s as part of the Urban Coalition and Merit Employer campaigns to improve school services to urban minority youth.

The largest growth in councils occurred in the 1970s. It paralleled the increased awareness of youth career development as a chronic problem area requiring joint planning and action across education and work institutions. During this latter period, the Work-Education Consortium Project was sponsored from 1976 to 1980 by the U.S. Department of Labor to demonstrate the feasibility of the collaborative council concept in over 30 communities nationwide.

Council Functions

The activities of local councils show great variety. They are developed locally in response to local definitions of important problems on which collaborative efforts could have some effect using relatively modest cash. Most councils display a strong tendency to concentrate energies on activities characterized as career orientation, career awareness, and career information. On top of these core interests participants also use councils as forums for identifying and addressing other timely issues requiring education-work linkages.

Over and over, council mission statements stress the need for more frequent, sustained communication between education and work organizations and leaders.

For many educators this emphasis on regular communication was a surprise. Many vocational, career, and community education specialists thought communication was occurring. But the persistent message from outside the schools and colleges was to the contrary. The evidence of inadequate communication could be found in the inadequate knowledge and understanding exhibited by too many students and dropouts.

The collaborative council movement can best be understood as a symptom of and one solution for the imperative need to create multiple, sustainable levels of communication and problem solving among schools, employers, unions, community service agencies, and individual learners.

CONCLUSION

The movement toward collaborative rather than confrontational problem solving is worldwide. This tendency responds to interdependent political, economic, and technological—as well as social and philosophical—conditions. Consequently, nations, communities, and individuals are more sensitive to and aware of this interdependence. But being dependent on so many complex factors also means that more people are vulnerable to unexpected changes.

The natural human response to uncertainty and vulnerability is to reduce risk. But reducing risk means building trust: trust in information about the future and trust in the future behavior of people. Trust in others is needed before one can make decisions about future behavior. Without trust, how will one know how other organizations will react to good news or bad? Having confidence in the future behavior of other persons and organizations is itself risky. So we end up with a trade-off: are the risks of relative self-isolation greater or lesser than the risks of depending on others? Where do we place our bets?

The answer to this puzzle lies in the idea of accountability. We have trust in others only as far as we think they can be held accountable for any breaches in trust.

Collaborative councils represent an attempt to build honesty, equity, reliability, and accountability (the basic components of trust) among diverse organizations and interests. Collaboration requires realism about the missions, resources, interests, strengths, and weaknesses of each collaborating partner. Each organization remains responsible for defining its own mission, securing its own future, and performing its own responsibilities for its clients, its staff, and its own self-respect and reputation. Yet each organization is but one part of a larger network of service, ideas, and quality accountability. Thus the success of youths and adults as they move into various education, work, civic, and family roles, will depend on interweaving basic education competencies, employability skills, and work experiences with the sense that each individual was treated honestly and fairly in his or her search for assistance. For anyone serious about achieving this result, collaboration among community organizations is an inescapable strategy and responsibility.

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The Role of Private Industry Councils in Training the Economically Disadvantaged

William H. Kolberg

When San Diego's Regional Employment and Training Consortium (RETC) decided in 1981 to expand its job training programs for economically disadvantaged people to meet the demand for skilled workers for Southern California's rapidly growing high technology industries, it turned to the San Diego Private Industry Council (PIC) for assistance. It was a logical choice. As the advisory group established by the Comprehensive Employment and Training Act (CETA) to increase business involvement in local employment training, economic development, and educational activities, the private industry council was able to tap private sector contacts that were needed to bring business expertise and support to the new job training strategy.

In less than a year, the San Diego PIC/RETC partnership had created two high-tech training centers and a system of performance-based contracting for on-the-job training that guaranteed jobs for program graduates. Local companies were active in all facets of the program—designing courses, donating equipment, providing instructors, forming consortia to administer the schools, and training workers at their plants.

By the end of 1982, success was easy to see. Nearly 500 economically disadvantaged people had completed training and found jobs. Plans were being made to establish two more training centers. And PIC/RETC had budgeted almost $2 million for its new training system for 1983. But equally important, the growing pool of skilled workers was attracting additional firms to the area, promising even more job opportunities for San Diegoans.

Variations of the San Diego program are being repeated in communities across the nation as government and business combine forces to restructure federally funded job training programs for the unskilled and the hard-to-hire to meet the skill needs of local employers. Often the initiative for these achievements has been taken by the local private industry council.

Private Sector Initiative under CETA

The PICs have established this record during a relatively brief history and

with limited authority and funding under CETA. Private industry councils were first created in 1978 when Congress legislated the Private Sector Initiative Program (PSIP) to increase participation in CETA's employment and training programs. Funds were not appropriated until fiscal year 1980, however, and fewer than 10 percent of CETA agencies had PICs in operation by January 1, 1980. Further exacerbating this slow start-up was this fact: the majority of PICs had administrative budgets of less than $50,000 in 1981, the first systemwide year of operation, and nearly all PICs shared top level staff with other CETA programs.

Despite these limitations, U.S. Department of Labor statistics and studies demonstrate that PIC programs substantially outperformed standard CETA programs. Final fiscal 1981 data, for example, show that Title VII, the program that authorized PICs, had placement rates 25 percent higher than standard CETA employment and training programs (Title IIB,C)— and at a 19 percent lower cost per placement.

The contents of Title VII programs differed significantly from other CETA programs. Specifically, they allocated 17 percent of expenditures to on-the-job training (OJT) programs, as compared with 9 percent for Title II. The opposite pattern occurred for work experience programs, a form of subsidized employment at the minimum wage. Title VII spent only 1 percent of funds on work experience, compared to Title II expenditures of 29 percent.

These figures are the key to understanding the difference in performance between Title VII and II programs. Work experience programs, whether Title VII or II, typically result in low placement rates. Nearly one-third of Title II funds were spent on subsidized public employment programs which placed few people in permanent private sector jobs; Title VII was oriented more to training and private sector placement.

An in-depth survey of 93 PICs conducted in 1982 by the National Alliance of Business also shows differences in operating experiences between the two programs. Forty-eight of these PICs reported *no* training subcontracts were granted to service deliverers traditionally utilized by prime sponsors for other CETA programs. Only 42 percent of Title VII funds were subcontracted to service deliverers involved in other CETA programs. These figures suggest active intervention on the part of private industry councils and their staff to tailor programs to respond to specific business needs.

A NEW FEDERAL TRAINING POLICY

The PIC performance record—and the success of an earlier, experimental CETA program, Skill Training Improvement Programs (STIP), that em-

phasized intensive skill training aimed at private sector placements — provided the foundation for the next step in the evolution of the nation's employment and training system. That was the passage of the Job Training Partnership Act of 1982 (JTPA), which became fully operative on October 1, 1983. This new legislation makes the private sector an equal partner with government in the design and delivery of employment and training programs for the economically disadvantaged and the long-term unemployed.

The JTPA gives PICs and state and local governments unprecedented authority over the expenditure of federal funds. It continues the recent trend away from centralization, delegating to the states most of the program administration and oversight functions once performed by the U.S. Department of Labor.

The law requires each governor to appoint a state job training coordinating council, composed of representatives from business, state agencies, labor, education, and community-based organizations, to advise the governor on JTPA matters. The state councils' initial responsibility is to recommend logical service delivery areas tied to local labor markets. Their major function will then be to coordinate all state and local services, to avoid duplication, and to present a consolidated approach to resolving the problem of unemployment.

The PIC Role

But the heart of the JTPA is the private industry council, the focal point for local decision making in each service delivery area. Under CETA, private employers more often than not served as advisors (and customers) of an employment and training administered solely by local government. In both letter and spirit, the JTPA seeks to balance the public and private roles. It elevates the former customer to a position of full partner, charged with equal responsibility with government for organizing, planning, and administering job training programs.

Within each service delivery area, the law specifies that local business — through the PIC — and local government shall have joint approval authority over budgets, service plans, and administration. In addition, the PIC is authorized to provide program oversight — reviewing, monitoring, and evaluating — in accordance with its own procedures. The PIC has authority to hire staff, to incorporate, and to solicit and accept public and private funds.

Although local PICs, like the state coordinating councils, will represent all segments of the community — business, government, labor, education, and community-based organizations — business has the major voice. The legislation gives business a majority on the councils and requires that a

business representative serve as chairperson. It also stipulates that business members should be "owners . . . chief executives, or chief operating officers . . . or other private sector executives who have substantial management or policy responsibility" in their companies. Without question, the JTPA intends that PICs be composed of a majority of influential business leaders, people with practical understanding and contacts with all important parts of the local political and business communities.

Increasing Business Involvement

The JTPA's purpose clearly is to increase the level of private sector involvement in the nation's job training system. Since four of every five jobs are in the private sector, it is only common sense to involve the private employer in the training of a skilled and motivated labor force. And given the record of success achieved by business participation in the STIP and PSIP programs, it can be expected that heightened business involvement under the JTPA will improve the employment and training system in many ways:

- Greater relevance to the needs of private employers, who know what jobs and skills are and will be in future demand and, thus, can better direct the allocation of scarce training dollars toward meeting those needs.
- Increased efficiency in training program operations. Business persons will bring a bottom-line, results-oriented approach to program management.
- Better marketing, because programs with a business stamp should produce trainees more acceptable to employers than the often unjustly maligned CETA client.
- High-percentage placement of program graduates with local employers, since business should be able to open doors in the business community.
- Increased resources as businesses commit private resources to support programs they plan, need, and believe in. The public sector has neither the resources nor the expertise to tackle structural unemployment problems alone.

THE PARTNERSHIP ELEMENT

The JTPA does not put the private sector totally in charge of the new job training system. It recognizes that labor force training also is a *public responsibility*, much as unemployment, declining productivity, and obsolete skills are public problems. The JTPA calls for a partnership—and the partners are part of a carefully crafted checks and balances system. The law

recognizes that *public* leadership is often necessary to bring forth responsive *private* leadership. The JTPA will be deemed a failure if the public sector—accustomed to complete control under CETA—does not adjust to its new roles and responsibilities, or if the expected private sector interest fails to materialize. Both sides need each other. Both are equally important.

A History of Interest

Employers have been involved in the nation's training and educational systems since the beginning of the vocational education movement around the turn of the century. In the decades since, employers have repeatedly tried to direct these systems toward their skill needs. These efforts often became tangled in the crosscurrents of conflict among business, educators, labor, and governmental bureaucracies. There were repeated attempts at legislative remedies at the state and federal levels, but there was little impact on day-to-day operations.

More recently, beginning with the manpower training programs initiated during the Kennedy and Johnson admininstrations in the 1960s, a number of the nation's business leaders have sought to persuade the federal government to change national policy and to use its funding power as the lever to focus attention on the festering social problem created by structural unemployment.

The formation of the National Alliance of Business (NAB) in 1968 was an effort by American business to involve the private sector in policy making for the nation's employment and training system and its implementation. Many businesses demonstrated that they could take advantage of even limited opportunities for involvement, despite the many roadblocks created by CETA. Recent history shows even greater promise for success under the JTPA.

Although the JTPA will substantially strengthen the authority of private industry councils to make decisions on training program design and operation, PICs can be expected to follow the success established by the PSIP and STIP. As San Diego demonstrates, employers must be allowed to take an active role if they are to be encouraged to take advantage of the products of the employment and training system.

ESSENTIAL ELEMENTS FOR SUCCESS

The San Diego experiment was a forerunner of the business/government partnership envisioned in the JTPA. In late 1981, the Regional Employment and Training Consortium (RETC), which administered all CETA programs for the city and county of San Diego, broadened the role of the San Diego PIC beyond Title II to include all adult CETA programs. RETC

wanted to use the PIC to broaden private sector involvement in these programs and to take advantage of the PIC members' industry contacts.

The four inter-related goals of the PIC/RETC partnerships were to:

- Meet the specific skill needs of existing industries;
- Provide a trained labor pool that would encourage new growth industries to move into the area;
- Train economically disadvantaged workers to fill new and existing jobs; and
- Increase private sector involvement in CETA-funded programs.

To achieve these goals, PIC/RETC emphasized two kinds of training programs: training in private, nonprofit facilities administered by industry-based consortiums to prepare workers for jobs in aerospace and microelectronics industries, and performance contracting with private firms to train and hire CETA-eligible participants. These firms would receive payment only after workers had been trained and hired, and had remained on the job for 30 days.

The two-track training system was so successful that nearly 100 percent of its graduates found jobs.

Two Successful Training Centers

The two training centers are the San Diego Technical Training Center (TTC), which has been training machinists and tool fabricators since late 1980, and the Microelectronics Training Facility, which enrolled its first trainees in August 1982.

The TTC prepares workers for careers as drill-press, lathe, milling machine, jig-bore, or general machine-tool operators or mechanical draftsmen. Training lasts from 12 to 16 weeks and takes place in a 14,000 square foot facility equipped with three classrooms and an industrial shop with more than 60 different machine tools valued at more than $1 million. Industry representatives help design programs, teach some courses, and serve on the TTC board of directors. Companies donate supplies, heavy equipment, and funds. These contributions comprise 15 percent of the center's annual budget. The remainder is financed by RETC. The 1982 fiscal year consortium contract with the TTC totalled $439,000; the fiscal 1983 contract is $500,000.

The Microelectronics Training Facility is a similar operation, established by local companies that anticipated a growing need for skilled workers. These firms agreed to fill 50 percent of their new entry-level jobs with program graduates. They helped RETC select a community-based organization skilled in training for the microelectronics industry to operate the center. The six-week training program emphasizes an orientation to the industry and introduces basic production-line skills. Trainees then move

into specific job training at any of the five participating firms. RETC obligated $400,000 for the microelectronics training facility in fiscal year 1982 and $500,000 in fiscal year 1983. Industries contribute equipment and provide some of the instructors.

The schools have been so successful that in 1983 the concept was expanded to training centers for the recreational vehicle and telephone installation industries.

Performance Contract Training

PIC/RETC also uses performance contracting with private companies. Hired as probationary employees, economically disadvantaged workers receive a training wage agreed on by the company and PIC/RETC. After training they become full-time employees with a wage equal to or greater than the entry-level wage of the job for which they trained. PIC/RETC reimburses the company a portion of the cost of training for each worker who remains on the job for 30 days. As an additional incentive, some trainees may qualify their employers for tax credits through the Targeted Jobs Tax Credit.

One company, for example, contracted to hire 23 workers and provide them with three weeks of classroom study and nine weeks of on-the-job training. The company was reimbursed more than $2,250 for each trainee it hired. Other companies that do not have the facilities for training have subcontracted the training to a community-based organization.

Performance contracts with individual companies totaled $585,000 for fiscal year 1982; fiscal year 1983 contracts total $980,000.

PARTNERSHIPS AT WORK IN BUFFALO

The achievements of San Diego's public/private partnership are not unique. In community after community across the nation, business and government are proving not only that they can work together, but that partnerships are essential to success.

Buffalo's economy had been crumbling for a generation. In the last 30 years, the area lost more than 70,000 manufacturing jobs—the mainstay of its economy—and the city's population had shrunk by 25 percent.

Faced with this steady loss of jobs and population, city and county officials decided it was time to fight back. In 1979, the city, its newly created PIC, and the county and city economic development organizations began the uphill battle to make Buffalo a good place in which to live and work again.

Buffalo officials came up with an approach that has been successful in many other communities. They decided that diversification through

economic development was the key to solving the area's unemployment problems. They knew they had to convince existing companies to stay and then attract additional industries.

Providing the Resources

The economic development agencies and the PIC began working together to provide firms with the three things they need—land, labor, and capital. They targeted companies in growth industries—high technology, light manufacturing, and service. They also made a commitment to provide training for jobs with solid futures. Given Buffalo's high unemployment rate—14 percent in 1982—it made no sense to train for low-skill, entry-level jobs. High-tech companies across the country are facing a severe skill shortage, so the PIC decided to design training that would produce skilled workers.

The PIC sent marketing account executives to talk with 800 local employers. They discovered that many companies had openings for skilled workers that they couldn't fill, and many more wanted to expand but needed financial assistance. To meet those needs, the PIC promised to fill those jobs through subsidized training and help the companies obtain financing. Job development and economic development were made interlocking parts of a united approach.

The initial step that proved vital to Buffalo's success was the establishment of a multi-jurisdictional private industry council. The city and county pooled their Title VII grants to finance the PIC and placed it under the authority of the countywide industrial development agency, thus uniting the resources of business and government.

Commitment and Cooperation from Industry

The PIC targeted its training dollars on companies that would guarantee job openings and which were committed to hiring graduates of its programs. One aerospace and industrial products manufacturer, for example, was encouraged to stay in Buffalo by the PIC's promise of precision machinists to fill the growing company's needs. Another company agreed to train and hire economically disadvantaged people as computer programmers and operators.

This training approach has been successful because most of the companies run their own training programs. Although the funding was provided through CETA, the training was done by the private sector, for the private sector, using performance-based contracting.

Additionally, the Buffalo PIC initiated a retraining program in cooperation with the state department of education that enabled a local General Motors plant to increase productivity and avoid massive worker lay-offs.

By February 1982, 400 GM employees had completed the program, including nearly 50 who had previously been laid off.

By working together, the PIC, local government and businesses have helped more than 100 companies since 1978, saving thousands of jobs and, despite continued economic difficulties, creating hundreds of new ones.

The story is the same, whether it's in Florida or Alaska, Maryland or Maine. Business and government can get the job done—if they work together. The people and places may differ, but the goals and the guideposts for success are the same. Job training programs tailored to the skill needs of business do make a difference.

THE NEXT STEP

Termed a "revolutionary change" by many, the new Job Training Partnership Act gives the stamp of approval to the exemplary private industry council involvement in local training and employment activities. And it provides both the mandate and the flexibility for these councils—working in close cooperation with local government, labor, education, and community groups—to restructure this training system to meet the needs of both business and the unemployed.

By building on successes and learning from failures, JTPA establishes the framework for a new, cost-effective training system that can meet local needs by uniting local expertise with national resources. The JTPA cannot provide all the answers, but it does point us in the right direction. Business and government are at last following the same path: working together to reach the common goal, putting America back to work.

The Boston Compact

William Spring

The present challenge to American education has been compared to Russia's launching of Sputnik. But in fact, it is very different. The race to the moon, win or lose, engaged only an elite group of scientists and engineers. The challenge now facing us requires an entire work force sufficiently well educated to earn for themselves and for the country a decent living in a technologically sophisticated world. Today national economic necessity pressures us to make good on our long-standing rhetorical commitment to quality education for all. In Boston, whose school system is one of the most troubled in the nation, school, political, business, university, and community leaders have agreed to attempt measurable year-by-year progress toward that goal.

On September 22, 1982, the mayor of Boston, the school superintendent, the president of the school committee, the president of Boston University, the chairman of the Coordinating Committee (the most powerful business organization), and the chairman of the Private Industry Council announced the signing of the Boston Compact at school headquarters. For Boston, where the business and political communities have been divided and both have been accused of ignoring the deeply troubled schools, it was an extraordinary scene of collaboration.

The Compact is a written agreement between the school system and the business community. Under its terms, the business community agrees to hire 400 June 1983 high-school graduates in permanent jobs and to expand that number to 1,000 within an additional two years, provided that the young graduates meet entry-level qualifications. The business community also agrees to help improve the quality of education in the high schools and to provide political support for the system.

Acting for the schools, School Superintendent Robert Spillane agrees to measurable long-term performance objectives for the high schools and to hold himself, teachers, principals, and administrators publicly responsible for meeting them. The goals include:

- A 5 percent increase each year in the number of students who graduate, based on the number who entered ninth grade.

- A 5 percent increase each year in the number of graduates who enter employment or enroll in institutions of higher learning.
- The requirement that by 1986 all graduates meet minimum competency standards in reading and math skills established by the school committee.

The minority members of the Boston school committee (two of the five members are black), who felt left out of the early discussions between the superintendent's deputies and business community, insisted that the committee's endorsement of the Compact make explicit, first, that minority young people would secure a fair share of the jobs and help in retaining them, and second, that the business community would support adequate funding for the schools.

The plans laid out in the 96-page Compact document are beginning to be implemented in 1983–1984 school year. The hoped for long-range improvement in the schools lies in the efforts of some 15 work groups in which people from the schools, business, university, and community-based organizations are developing specific plans for improvement. The work groups range from athletics to the arts and include basic skills, alternative education, electronic learning, career and vocational education, curriculum, counseling for postsecondary education, and research and evaluation.

THE BOSTON BACKGROUND

Trouble in the Boston schools begins at the top. In the past nine years, seven superintendents have grappled with a system where administrative responsibility has been divided among the courts (for pupil assignments), the school committee, and the superintendent. Chaos has often won. In the school year ending June 1981, the system operated $20 million in the red. Even worse, as late as May no one knew whether the deficit was going to be $10 million or $40 million. The educational results included high dropout rates, poor daily attendance, and a situation where one third of our secondary school students were unable to read at the high school level.

Employers and college admission officers generally agree that many Boston public high school graduates have been ill-prepared for either jobs or further education.

However, during the long difficult years, there have always been reminders of excellence and the foundation for progress. Boston Latin and the Latin Academy (formerly Girls' Latin) have upheld their standards. Boston High School, under headmaster Joseph Ippolito, provided a national model of what a work-study high school could accomplish for young people unable to cope with a regular school. Ippolito demonstrated that Boston

businesses would provide paid work and learning opportunities if they had confidence in school leadership and that troubled young people would respond to both the challenge to learn and the opportunity to earn within a carefully structured program.

The Hubert H. Humphrey Occupational Resource Center in the heart of the Roxbury ghetto is just the well equipped inner-city vocational education facility that AVA Executive Director Gene Bottoms has long been calling for. Used by Boston high school students by day, it serves on nights and weekends as the classroom site for area construction apprenticeship programs.

Existing Partnerships

Partnerships between individual Boston high schools and business firms and pairings with universities go back to the first days of desegregation in the mid-1970s. In fact, it was the Tri-Lateral Council for Quality Education, the coordinating agency for 21 major employers partnered with 18 secondary schools, that gave a major impetus for the Compact when its board—which includes deputy school superintendents as well as company vice presidents—secured Superintendent Spillane's agreement, soon after his appointment in 1981, to the setting of long-range, system-wide standards against which the progress of the partnerships could be measured. Through the work of the Tri-Lateral partners many middle-level school and business people have grown accustomed to collaboration.

The city employment and training agency and the school system also have had years of experience in working together, particularly under the Youth Employment and Demonstration Projects Act. For three years, some 4,000 Boston young people were guaranteed jobs, mostly public, if they would stay in school or return to an alternative education program. Finally, the Boston Private Industry Council (PIC), set up under the 1978 Comprehensive Employment and Training Act (CETA) amendments, provided an opportunity for public-private partnership of which Mayor Kevin H. White and PIC chairman William Edgerly, of the State Street Bank, took maximum advantage.

With the PIC taking the lead, the Boston summer jobs program for young people from public high schools grew from 550 private sector placements in 1981 to over 1,000 in 1983. More than 95 percent of the employers have been satisfied and have learned to trust the PIC, the schools, and the young people.

The Need for Upgrading the Schools

In 1981 and 1982, a series of seminars brought home to the business community the implications of the passing of the baby boom generation.

By 1995, employers learned, there will be 20 percent fewer people in the job-entry age group (16–24) in this country, and the proportion of minority youth entry level will increase significantly. At the same time, new entry-level jobs will increase in complexity and demand workers who have basic skills in language, mathematics, computer technology, and critical thinking. If Boston hopes to continue its progress in the medical, electronic, computer, machining, and service industries, it will need a sizable number of well-trained high school graduates. Business leaders agreed that to meet this need they must actively participate in a substantial upgrading of the city's schools.

The Jobs Collaborative

The business community's efforts to organize the school-to-work transition began with a grant from the Edna McConnell Clark Foundation to the Boston Private Industry Council in 1981 for the Jobs Collaborative in-school program. The program is run by a teacher jointly selected by the headmaster (as high school principals are called in Boston) and the PIC, and on the PIC payroll. "Career experience teachers" are each responsible for working with 60 students on basic skills and job search and retention skills, and for helping to develop and place them in part-time jobs during school and full-time jobs upon graduation.

The Jobs Collaborative steering group includes the school director of vocational education and representation from the city, business, and community-based organizations. The group helped pull together the many organizations that made possible the rapid increase in summer jobs placements. Together, the in-school and summer programs demonstrated a number of key points: first, that Boston high school students performed very satisfactorily on the job; second, that the Private Industry Council was a reliable, effective organization; and finally, that many groups, city and school, business sector, and community-based organizations, could work together effectively.

The school-to-work transition was discussed at length in the winter of 1982 at PIC board meetings—where Superintendent Spillane was a member—with the Tri-Lateral Council board members and with the staff people drawn together at the monthly Jobs Collaborative steering group meetings.

Priority Hiring as a Bridge

In June, the PIC chairman and school superintendent laid out the concept of priority hiring to the city's most influential business group, the Coordinating Committee. The idea was accepted in principle. Roderick MacDougall, chief executive officer of the Bank of New England, stated the

consensus: "It is only fair, if we are asking students to meet new, rigorous standards, that we be willing to show that the hard work will pay off."

The concept of priority hiring is straightforward. The business leadership as a group accepted responsibility to find 400 jobs for 1983 graduates, and to sign up 200 firms to the priority hiring pledge. The pledge campaign was successfully carried out by the Chamber of Commerce and some 265 Boston firms signed a pledge to give priority in hiring entry-level workers to high-school graduates who meet their entry-level requirements. It is the job of the Private Industry Council staff to work with the committed firms to determine precisely what their entry-level qualifications are and to set up a referral network. The companies agreed that a fraction of their entry-level positions would be made available to high school graduates and held open long enough so that referrals from the Private Industry Council and interviews could take place. While no student is guaranteed a job, each knows there is a job available if he or she is successful in the interview.

EARLY RESULTS OF THE COMPACT

The superintendent's commitment to sound education policy is already showing results. While balancing the budget, Spillane has developed basic curriculums for the elementary and middle grades and has improved fiscal and personnel management. He has replaced almost half of the high school headmasters and restructured the administrator role of the schools to improve accountability and to make the most of the outside resources mobilized by the Compact.

The school's budget for 1983–84 reflects a solid commitment to Compact goals, including nearly $1 million for basic skills remedial programs in each high school and another $1 million to establish computer labs in each school with the help of private firms. The computers are to be used for assisting skills instruction as well as for computer training.

THE WORK GROUPS

Research and Evaluation

Measuring progress toward improved attendance, language and number skills, and postgraduation experience requires base-line data, data that is not only accurate but agreed-to by both school and community leaders. At the time the Compact was signed, the school system was without a planning department. Although a good deal of information on pupils was required by the Federal Court, little was gathered and less published on a regular basis about educational attainment.

Daily attendance was reported by each school to a central computer that provided printouts on the missing by mid-morning. However, there was

no clear definition of "dropout." All that was known was that of those in a typical class registered in the freshman year, 47 percent were gone by fall of their senior year. And the only data available on postschool experience came from an exit survey of seniors in May. While handing in their textbooks upon departure from school, they were asked about next year's plans. Usually about half said they were going to college, the other half expected to be working.

For the Compact work group on research and evaluation, the Federal Reserve Bank has conducted a phone survey of the 1982 graduates, which will be available shortly, and an employment survey of all underclassmen in the spring of 1982. With the help of the university experts, the work group is putting together a plan to establish a research and evaluation operation within the system.

Career and Vocational Education

In cooperation with the job development work group, the career and vocational education work group is developing a competency-based employability-skills curriculum to prepare graduates to compete successfully for jobs pledged by firms subscribing to the Boston Compact. School staff will use existing employability materials to certify student mastery of the particular requirements specified by personnel directors.

The career and vocational work group is also encouraging the introduction of career education into the regular high school curriculum. A pilot project called "Career Passport Program" will help students in a few high schools market themselves to employers and colleges in 1983–1984. Other programs will emphasize employer-based career education using business facilities and personnel to familiarize high school students with opportunities in high demand/high growth occupations.

Personnel directors from a number of Compact companies attended a meeting at the New England Life Insurance Company to help define the concept "qualified" and to set in motion a process to define and inculcate employability skills. Stop & Shop, John Hancock, the Federal Reserve Bank, New England Telephone, the Bank of Boston, Boston University, the Boston Globe, and Blue Cross/Blue Shield were represented.

Electronic Learning

The electronic learning work group has developed a three-year $1.5 million plan for a computer laboratory in every Boston school. Business education teachers have infused computer literacy into accounting and office procedures with the help of federal grand funds. Equipment and technical assistance from the Digital Equipment Corporation is crucial to the execution of the plan. The company, which has been working closely with the Hum-

phrey Occupational Resource Center for the past three years, has agreed to expand its efforts by co-sponsoring the electronic learning program throughout the Boston School system.

JOBS AND EDUCATION

Some have warned that time spent working for pay while in high school will detract, or at least distract, from the more important investment of time in education. In Boston, the survey of all high school students in ninth, tenth, and eleventh grades showed that those most likely to be working while still in high school were those attending the system's prestigious and academically excellent exam high schools. At Boston Latin, for instance, fully 67 percent of the students surveyed were working compared with 31 percent district high schools students.

Roxbury is one of Boston's poorest inner-city neighborhoods. As recently as the 1950s, most of the young people from such a neighborhood would have been winnowed out in the educational process before high school graduation. And they would have found a niche in the world of unskilled and semi-skilled employment in the city's textile, leather, and service industries. That is how the system operated. However, those unskilled jobs have now nearly dried up. Most entry-level work already requires a confident grasp on the use of letters and numbers. And the jobs with a future—the jobs on Route 128, the "nation's technology highway"—will require computer keyboard skills as well. An educational system that shunts many young people off into futureless employment is no longer acceptable. The challenge to school systems and businesses in our great cities is this: How do you fully prepare the children of Roxbury for the world of Route 128? Never before has the path of hope so clearly led through the classroom.

How can we reach young people we have missed in the past? Part—only part—of the answer, we believe, is to make it unmistakably clear that school pays off in terms of economic opportunity.

Keeping Students in School

One idea we have learned from the careful research done on the Carter administration's youth employment and training programs (through Vice President Mondale's Task Force on Youth Employment) is that the reality of a job is a powerful inducement to bring poor school dropouts back into education and to hold in school those who are contemplating dropping out.

The root causes of school leaving are complex. If a youngster is reading two or more years below the level of the texts used in the high school history class, he or she is in trouble. Three or four months of sitting in

class after class not understanding what is going on would drive most of us to take some kind of evasive action. Education relevant to the level of attainment of the young person is the first step needed to hold young people in high school. But the certain knowledge that the system rewards effort and that there is economic hope for the graduate is also important.

For those coming to school from public housing in Roxbury—or the predominantly Irish Charlestown or South Boston projects—the bleak economic experience of parents, aunts and uncles, and brothers and sisters gives ample grounds for doubts about the rhetoric of opportunity. That is why the Compact's emphasis on communicating to young high school students that Boston's business community is on their side, if they will just do their part, is so crucial to the Compact's commitment to educational improvement.

Building Mutual Understanding

The entry-level job market is characterized by ignorance on both sides. The average high-school student from a poor family lacks critical basic information and skills: the ability to apply for, obtain, keep, and advance in a job. At the same time, people in the private sector with the responsibility for filling entry-level jobs don't fully understand young people of high school age, particularly those who are poor. And young people from very poor homes lack the network of employed fathers and mothers, aunts and uncles that smooths the transition for the better connected. The Boston Compact is creating a bridge between the school and the business community that will make it possible to develop accurate information on both sides of the door and to build new institutional relationships that provide opportunity to all who will prepare themselves.

The Example of Germany

We can learn from other countries. One of the most attractive features of the American education system is that we would never support a "tracking" of young people for life, before a reasonable assessment of their talent and inner-desire can be demonstrated, as is done in Germany. However, it must be noted that the German system does have this advantage: institutions to provide a thorough education in technical skills and an introduction to the world of paid employment for non-college students have been carefully developed. Well over 90 percent of those not headed for college spend the last two years of high school dividing their time between the classroom (for academic subjects) and paid private sector employment in training jobs. The result is that there has been little unemployment in Germany among 18 and 19 years olds. And while companies take on more trainees than they will be able to permanently employ, graduates of the

education system have both basic academic skills and confidence in their ability to perform on the job.

In Boston, we hope to develop an American version of this model, preserving the freedom to pursue college education while building institutions to ease the school-to-work transition.

READINESS FOR CHANGE

Growth in a community is more organic than mechanical. Change grows from roots, not from blueprints. Those who joined in the Boston Compact understand that we have moved into a world where the traditional lines between work and education are becoming increasingly blurred. Change in technology and life styles have changed the traditional career path of 12–16 years of schooling followed by a lifetime in one or two lines of work. The Boston schools hope to prepare young people for the life-long learning and flexibility that the 1990s will require. By forging closer ties with the business community, the Boston Compact hopes to improve vocational education as well as the system-wide revival of the high schools.

Increasing the number of young people going to college is just as important a Compact goal as measuring those going on to jobs. To help approach that goal, area colleges and the schools have nearly completed work on a set of agreements analogous to those between the business community and the schools. Only time will tell if the goals of the Compact can be reached. But this much has been shown already: with a bit of leadership, a deeply troubled community can build on its better traditions of cooperation and not be forever subjected to the pull of disintegrating bitterness.

In an era when federal dollars are simply not available, the New England tradition of self-reliance has been tapped to begin the long process of rebuilding the local school system. There was a time when it looked as if the federal government would pick up the cost—and dictate the design—of adequate programs. The truth is that the federal dollars were never adequate for even a fraction of the need. And the federal guidelines encouraged, and sometimes required, a segregation of programs which had the effect, if not the intent, of isolating the people they were designed to promote. I believe that substantially more federal resources are critically important in the long run to meet the inner-city crisis in education and in jobs for young people. But just as important is the development of efforts such as the Compact with mutual self-discipline, measurable goals, and a long term commitment to making a major difference.

SECTION V

Looking Toward the Future

The seeds of collaboration in the future are to be found in the social, economic, and educational conditions of today. What will the conditions for collaboration be in the future, and what will that collaboration look like?

Joseph I. Lipson examines the ways in which technology needs to be adapted for effective instructional delivery and how organizations must change to use the new technology productively. His chapter explores current technological developments and their implications for training and collaboration between vocational education and the private sector.

In an imaginative scenario, Paul E. Barton describes what may occur in collaborative efforts by the year 2000. He simulates a meeting of organizations planning another yearbook on collaboration, a book that will look backward to 1983 and forward to a future not yet known.

Donald F. Averill

Adapting Technology for Instructional Delivery

Joseph I. Lipson

For millions of Americans, the quality of their participation in the work force during the next two decades will depend upon vocational education and training offered in the workplace and in other institutions. Computers, automation, and robotics will multiply human productivity. This will, in turn, cause even more massive job dislocation than we have already seen in the automotive and steel industries. Workers, if they are to find employment, will need new knowledge and new work skills. And we are not likely to achieve the needed level of training and retraining with conventional instructor-based approaches. What will we do with the profits that result from the latest productivity increase? Will we use some of these resources to invest in people through vocational training?

The new information technologies already in existence, together with those just over the horizon, indeed have the potential to be the core of a cost-effective training system. But the successful application of these technologies will require an unprecedented cooperative effort between vocational educators, government, and industry.

CURRENT STATUS

Computer-based vocational instruction is just at the beginning of its expansion curve. It is presently used in a limited way for drill and practice, simulations, and as a textbook with branching and limited answer-processing. While some companies such as General Electric and IBM make extensive use of the computer in their training programs, the kind of instruction that can be offered is limited by our knowledge of the learning process, the preparation of those who write training materials, and the hardware and software that is available.

The instructional use of computers is limited by their memories and the sophistication of the programs in the following ways. Limited memory means that one cannot have a rich supply of instructional alternatives, graphics, or in-depth development of a topic. Any instruction that requires photographically realistic images, interpretation of the color of metal stock

in a lathe, for example, cannot be served by the computer alone. Because of program limitations, only a limited range of student inputs can be accepted, interpreted, and answered. As a result, the interaction of student and computer has none of the richness of a conversation with a knowledgeable human.

On the positive side, the fact that the computer is a logical device makes it ideal for teaching procedures with definite sequences such as office procedures or equipment operating procedures. If the procedure can be taught by means of text or line drawings, such as chemical titration or the operation of a nuclear energy plant, the computer alone can teach and can keep track of what the student does and provide feedback on steps of the procedure.

If instruction requires photographically realistic images, they can be supplied by a videodisc. One side of an optical (laser) videodisc contains up to 50,000 individual pictures in full color. The combination of the image capacity of the videodisc with the logic of the computer gives us the so-called "intelligent" videodisc. This combination has been used to teach trouble shooting of military equipment, medical diagnosis, equipment maintenance, laboratory procedures, and other topics that require rich visual content.

However, producing an interactive, computer-controlled videodisc is complex and expensive (about $100,000 to $200,000). The cost of videodisc equipment significantly increases the cost of a student station. As a result, the interactive videodisc is just beginning to be used to supply point-of-sale information and technical training in industry, medicine, and the military. Use is limited in spite of the fact that for complex skill training involving problemsolving, the evidence suggests that interactive, computer-based simulation training is less expensive and as effective or more effective than instructor-based training.

Finally, a complete instructional system needs a communication system that permits messages to be sent, records to be kept, and timely information to be distributed. A friendly message system enables instructors and students to compensate for the limited intelligence of computers and enrich the training experience. Messages allow the asking and answering of questions, the sharing of information of specific topics (electronic bulletin boards), and access to electronic libraries and data sources. These kinds of facilities are being developed, but to my knowledge, most electronic data sources available today are not of the greatest relevance to training in specific business and industry skills.

In summary, a training system needs information, sophisticated logical programs, a source of images, and a communication network. In each of these dimensions, present computer-based systems *can* perform, but often

at a cost that most firms, industries, and schools are unwilling or unable to bear. As the cost and quality of computer equipment decrease, as the sophistication of software and authoring tools increases, the computer/videodics workstation will become increasingly attractive as a means of dealing with the training needs of a society in which product specifications and services are constantly changing. However, a large investment and much work will be required.

THE FUTURE

Hardware

For a given amount of money, the power and memory of computers doubles every two years. This trend seems likely to continue for the near future even though it seems that some revolutionary as opposed to evolutionary changes may be needed to keep squeezing more and more memory and computing power into smaller and smaller spaces. Bulky cathode ray tubes will gradually be replaced by compact, flat, high resolution color screens. Thus a powerful and affordable computer will be contained in an attache case. In 5 to 10 years the amounts of information that can be economically supplied will be truly astonishing by today's standards. An entire technical library with pictures will be available to the industrial trainer and his/her students.

Software

Over the next decade, dramatic changes will take place in software development. We will have voice synthesis and voice recording that will permit large amounts of spoken instruction that will greatly simplify certain kinds of training. We will have improved voice recognition, touch sensitive screens, cursor controls, and other devices ("joy sticks" and "mouses"). These will give the student a sense of freedom and ease of communication with the computer (and other people).

Authoring Systems

Another critically important change will be the development of authoring systems that permit a subject expert to construct sophisticated computer-based training materials with no requirement for programmers or knowledge of programming. Friendly authoring systems will greatly improve the quality and acceptability of computer-based training materials at the same time that the cost is greatly reduced.

Authoring systems will have the following properties: powerful routines for producing graphics that are so critical to most vocational-technical training; menus to guide the beginning author, help commands to remind

the author of the options available; programs that permit the author to use natural language commands; and sophisticated answer processing (simulations) that will permit the author to make instruction much more relevant and challenging.

To summarize, future anticipated developments will greatly enhance the capability of computer-based technology to deliver technical training at reduced cost if the needed effort is made. When all the features of hardware and software are combined, a concept called "embedded training" will be feasible. This means that each learning site will have enough computer power contained in it to permit a trainee to constantly receive guidance and instruction at the moment needed and at the proper level—taking into account the individual's strengths, limitations, and knowledge. This interactive intellectual aid should greatly increase human productivity by its timeliness and its relevance to the task at hand.

REQUISITES FOR EFFECTIVE USE

In applying a new technology, it is important to appreciate its strengths and limitations and to match the technology to our understanding of how people learn. When one uses classroom instruction, one can use tradition as a guide. These traditions often lead to false assumptions about computer-based education. Actually the two approaches to instruction are strikingly different and the best ways for students to use a computer are not fully understood. For example, a computer cannot listen to a student explain something and say, "I think that your problem is the following _____." On the other hand, the computer can patiently and persistently lead a student through hundreds of variations of a trouble shooting problem without becoming exhausted or irritable.

Important advances are being made in the educational fields, such as learning psychology, information processing, human factors, artificial intelligence. These advances will provide the foundation for principles of learning that should be incorporated into computer-based training systems. Someone on staff should keep up with developments in educational research and bring the implications of new research to the training effort.

Linking Industrial and Public Sector Technology Efforts

Our premise is that industry will be guided in its decisions by relatively short-range, job-specific considerations of profitability and training needs. Industry tends to underestimate its training needs. Therefore, much of the cost of training in industrial settings is hidden. Employees either take time during working hours to "bootleg" needed knowledge and skills or try to do without those skills. The general consensus of people I have spoken

with is that, for essential training, such an approach is pound foolish and not even penny wise.

Where industrial firms—especially large companies—do have a training program, they often use the latest equipment and sophisticated course development systems. Public sector institutions usually cannot afford this equipment.

Public sector institutions have difficulty in meeting the rapidly changing employment requirements of the high-technology age. They may train solar energy installation technicians just when an oil glut develops and the solar energy business collapses for a while. Or, they may train electronic equipment assemblers just when major producers decide to build their assembly plants in Malaysia.

The great strength of public institutions lies in their ability to (1) educate high-level training personnel in the general principles of training and the proper use of advanced instructional technology and (2) educate students in the basic knowledge and skills that will make them adaptable to a wide variety of tasks and capable of learning effectively throughout their working lives.

So, how can the two systems be linked to provide more effective vocational training? I would recommend the following steps.

Industry Tasks

Industry should do the following:

- Make computer-based courses developed by industry available to public sector institutions to be used as samples or for actual job-preparation when such jobs exist.
- Allow students to use advanced industrial training equipment and training technology available to public sector institutions during off hours, via telecommunications, for example, so that both faculty and students will become familiar with what real business concerns are doing.
- Form joint committees with public sector institutions to plan for future training needs and to plan and develop new courses using the new information technologies.
- Create a joint fund by various mechanisms for the joint committees to allocate. Before course development is started, both industry and the public sector should make a commitment to use the completed courses, subject to expert review for instructional and content accuracy.
- Donate equipment to public sector institutions with tax reduction as an incentive.

Public Sector Tasks

The public sector institutions should make extensive use of adjunct faculty drawn from industry and business to make sure that what is taught is directly relevant and important to current industry/commercial needs. Since small business is responsible for most new jobs, people from small business should be represented. Where needed, the public sector institutions should provide courses for adjunct faculty on the basic principles of learning in general and of adult learning in particular.

The public sector institutions should allocate a greater fraction of their budgets to acquire and maintain information technology so they can offer sophisticated courses prepared for this new system of instruction. Faculty, students, and people from the business community should be organized to (1) use the technology productively and (2) complement the computer-based training with conversation, tutoring, and a variety of other activities that require human intelligence.

Can such linking occur?

My guess is that little except talk will occur unless there are monetary incentives to collaborate and monetary penalties for failure to make linkages. However, there are a large variety of social and government mechanisms for increasing the probability of cooperation without making it an absolute legal requirement. These include tax reduction, partial payment of salaries of adjunct faculty, subsidies for course development, and reduced prices of developed courses as a result of government subsidies supported by industry-based taxes.

It seems clear that a system that combines the reality and advanced techniques of the industry/business community with the longer-term view and knowledge base of the public sector will result in much needed improvement of vocational education.

CONCLUSION

As always, conditions of rapid change produce turmoil and opportunity at the same time. The new computer-based age is generating massive forces of upheaval in the world of production and business. This, in turn, brings the need for a national effort to train and continually retrain millions of workers. However, the very technology that is causing the problem will be part of the solution if our vocational educators, government officials, and business leaders can cooperate, provide the leadership needed, and learn about the strengths and limitations of the new technology.

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A Futuristic Scenario: Collaboration in the Year 2000

Paul E. Barton

A meeting January 4, 2000 in the conference room of the American Human Resources Council (AHRC), Rosslyn, Virginia.

Present: Executive Director, AHRC
Executive Director, American Vocational Association (AVA)
Executive Director, American Society for Training and Development (ASTD)
Executive Director, American Association of Community and Junior Colleges (AACJC)
Executive Director, Association of Commuity Collaborative Councils (ACCC)
Representative, National Association of Manufacturers (NAM)
Representative, American Federation of Labor-Congress of Industrial Organizations (AFL-CIO)
Representative, Chamber of Commerce

AHRC: The purpose of our meeting today is to set a theme for the AHRC yearbook, which is a joint effort with all of you. In preparing for this, I was rummaging through the AVA library downstairs looking at all the old yearbooks. I came across the one for 1984 titled *Collaboration: Vocational Education and the Private Sector*. Sometimes it gives perspective to look backwards at how far we have come and how things have evolved.

When I started in this field 20 years ago, I read a little book called *The Unconquerable Senator Page*, by Melvin Barlow. He had come across some old files in the AVA archives and found that Senator Page from Vermont had played a key role in the formulation of the Smith-Hughes Act of 1917, but never got credit for it. But what I really learned from that little book was that vocational education was started by a collaborative effort among the NAM, the AFL-CIO, and reform-minded educators. It got me interested in the process of restoring that collaboration, which was not really much the practice by the late 1970s when that book on Senator Page was published.

AVA: Could I break in here? That's interesting if you are a historian, but we had collaboration in the beginning, and we certainly have it now. I thought we were going to focus on some of the few remaining rough spots. What are you leading up to?

Chamber: Yes, those rough spots. I have been talking a lot at these meetings about the small employers who are our members. There are success stories aplenty, but we still have too many small businesses that can't afford training programs. While AHRC has worked on this—for example, the series of regional conferences last year—we are still having a hard time getting joint programs with the schools to meet our needs. The fees are too high, and I think the overhead charges should be lower than for large corporations.

AHRC: Well, I certainly want to discuss those rough spots. You know, it's the fact that we can now work on the "rough spots" that makes me feel that we are really getting somewhere. That's why AHRC was created in 1988. The need was really being felt for a more regular arrangement by which we could all work together—some way of getting on top of the problems.

At a conference when all our organizations were together, someone got up to ask a question, and it turned into a speech about how the American Council on Education had pulled together all the higher education associations. They had a common purpose even though they had their own separate agendas and constituencies. An organizing committee was convened around the notion that we had a somewhat similar problem—larger, in fact, because of the variety of sectors and organizations that were concerned about vocational education and meeting skill needs.

AACJC: Well, I remember that. Although we are in the post-secondary education community, we were becoming a really large supplier of specific industry skill needs, and we were also beginning to work with the unions—on such landmark programs as the dual enrollment program with operating engineers. So we came along, too, knowing that we had to keep a balance between our general education offerings and specific occupational education.

AVA: That's interesting. Our history was a mixed one, with a lot of separation from general education and a concentration on specific occupational education. We had to achieve balance also, because employers were complaining that high school graduates were not well equipped in the basics. We have found that we could balance it. The collaboration we have achieved with employers and unions has really kept us in better touch, to

say nothing of the *joint* occupational education programs we have going throughout the country.

NAM: I'm glad to know you recall that problem of balance, and close working relationships. From the manufacturing companies' standpoint, we are really getting somewhere. We are beginning to talk about extending our joint programs with vocational education and community colleges to some of our multinationals. We are finding skill needs in operations in Mexico and other places where we want to extend use of education institutions to train for us in those countries. I think we will see movement toward multinational educational institutions, too, as a parallel development.

It must be history week. I was looking at some NAM history myself. We didn't really have an education staff as we began in the 1980s, although we had done some important work earlier on industry-education collaboration. But 1983 was sort of a turning point for us. We were hearing the need from our members.

AHRC: Parallel multinational education institutions! Well, the more I bring up the past, the more you all plunge into the future. I was thinking of where we had come from. Perhaps we ought to be talking about strategic planning for the year 2050.

ASTD: I don't want to spend much time looking over our collective shoulders, but maybe it's a good time for taking stock. I don't want us to get complacent about how well we have all done. Actually, ASTD really grew in the 1970s, and in the 1980s the development and use of the *human* resources got attention in corporate board rooms. Those tough times in the early 1980s of loss of both foreign and domestic markets to our competitors really shook us up. We had to look to a highly-trained and flexible work force to get us back into the game.

Even then, there had developed huge education and training programs in industry. Schools and colleges didn't know much about it. Called it the "shadow" education system. We don't think so much now in terms of "us" and "them." Too much integration for that—people from industry doing teaching tours in schools and colleges—people in schools and colleges working right in the companies, instructing under contract. And we don't have to make the large investments in remedial education that we used to.

AFL-CIO: That point you just made makes it time I jumped in. There is still a good bit of "us" and "them" as far as labor and management is concerned. But we see eye to eye on this education and training situation. Our members are the workers who need it and get it. In fact, more cooperative work between labor and industry has fit well into more cooperation

generally when it comes to making a competitive American product. These joint labor-management efforts on "quality of working life" and quality circle approaches (as they were called back in the late 80s) have all been a part of it.

AVA: There was a lot of yeast rising back 20 years ago when the 1984 AVA yearbook was written. There was a whole lot of talk about partnerships. There were some local and state education-work councils and industry-education-labor councils that the National Institute for Work and Learning (NIWL) and the National Association for Industry-Education Cooperation (NAIEC) had a hand in creating. And there were private industry councils. A fledgling movement it was, but the need was there, and the momentum was kept going.

ACCC: If we are going to keep this history class going, this is where we came in. It was fledgling, but hardly a movement. In 1982, NIWL put out a directory of 150 collaborative councils. A few were born each year, and a few died. As for PICs, they were really the creation of government legislation. They made it a lot easier to run on-the-job training programs for the disadvantaged. They were chaired by employers, and they had a few educators and union representatives on them. But remediation and prevention were not given equal representation, as would have happened with a larger education input.

Well, it began to come together in the midde 1980s. The problems were hard, and when people stopped blaming everyone else for creating them, they decided to hang together, instead of separately. Our association came into being in 1985. Our employer, school, and union members run their own show and still have enough to complain about how the others run their affairs. But they know they can't go it alone in the skill development business, so they are reconciled to working pretty close together.

AHRC: Once you get these councils on solid ground and doing something instead of mostly talking, what kinds of big problems developed that were threatening?

ACCC: There were a few that stand out in my mind. Each party wanted things improved. But these collaborative efforts required giving up some autonomy. Not in basic ways, but you had to stop rushing forward on your own and ask whether there were better ways and whether joint effort would produce firmer results. That was not exactly an issue, though.

Another one was the effect of success in some places. After five to ten years of working together through these councils, it became routine to do so in a great many places. It worked. Business had a forum in which to get its view across about education and training. Vocational educators

often found industry would listen when they said they could provide the training firms were providing internally. They often spoke with one voice when it came to appropriations. So the day would come when in a few communities they would conclude that the right things were happening without going to all those meetings and serving on all those subcommittees.

AHRC: Did you oppose that when it happened and try to convince them to stay together?

ACCC: We did at first. After all, we are a membership organization. You know what happens when you lose members—hard on your budget. When we became more thoughtful about it we realized it was the *substance* of collaboration that was important. If it was happening and became a habit, it didn't need a formal organization. Now, just because we lose a council doesn't mean we have lost collaboration. Sometimes we still lose both, however. We find it rediscovered later by some new leadership.

But there was . . . always is . . . a big issue. You have already talked about it this morning in terms of balance. How much should education institutions, particularly tax-supported ones, *be* responsive to specific (sometimes narrow) employer needs? After all, they have to provide *education*, and it has to be broad enough to enable a person to function well in all walks of life. So sometimes the balance would have to be struck again. Of course, employers recognize this goal of education, so this is not necessarily a polarizing issue at all. It's just that sometimes the pendulum swings farther than the community wants it to.

AFL-CIO: But you still haven't identified what made this collaboration "movement" take off and keep its momentum. I know we were involved a bit beginning in the mid-1970s, but not a lot.

ACCC: It wasn't one thing. It was a combination of problems and needs. They became pressing enough that these sectors saw they were going to have to work together on them.

Youth unemployment wouldn't go away, even though many were hoping it would in the mid 1980s as youth became a smaller portion of the labor force. More in-school youth continued to want jobs, and as more women and older people also wanted them, the youth employment problem persisted. So employers and educators and unions had to work on it.

The high-tech explosion took off by the mid 1980s—affecting just about all industries. Reporters and secretaries alike began to work at home on terminals—connected to all the other people they had to work with. Comfortable for them, but they had to know computers, which were always getting more sophisticated.

By 1990 it was as impossible to get a good computer repairer to come

to a home as it was to get a good plumber in 1980. Robots in the factories took a lot of jobs, but everyone was amazed at how much servicing they took. The Robot Repairers of America were organized in 1992, you will recall, and we have a joint degree program going between a community college and their apprenticeship program.

Then, we stopped talking about "dislocated workers" as though they were an embarrassment to our renowned industrial economy, and started doing something about giving them the skills they need. Employers, educators, and unions all just had to be involved. President Wright said in a speech: "It's not the workers who are dislocated. It's our values that are dislocated. And unless we keep the workers maintained as well as our machines, the national purse is going to be dislocated." So now call them the "advancing workers," and at any one time one out of ten people is in retraining, for up to a year at a time.

AVA: That sure hits the highlights. There had been a lot of collaboration between vocational education and industry. In some communities and schools it was a way of life. The vocational school in Dayton, Ohio, had operated on a cooperative education basis—jointly with industry—since 1914. There were a lot of effective industry advisory committees. But the general picture going into the 1980s was one in which vocational education schools were too isolated from industry, and industry was doing more and more of its own training.

There was a turning point. You have referred to the 1984 AVA yearbook. When we took our own look at it we did some more research. 1984 was not just the year of a yearbook. It was a whole year of effort to sort through how vocational education and industry could work better together. The annual convention that year was on collaboration. The year began with Gene Bottoms' report in the AVA newspaper. Brought a copy with me. It reads:

> We plan to begin a five-year initiative to strengthen our professional partnership effort with the private sector. We will seek to establish a national forum composed of corporate chief executives and key national and state policymakers. . . . We have asked the Board to set collaborative efforts with the private sector as the theme for next year's convention. We also plan to expore with state associations what we can do to provide them with technical assistance in developing a private sector component as a part of their state vocational association.

That was the year AVA began to do more long-term strategic planning. Collaboration was central to the plan. For AVA, that was the take-off year. We go about it on a lot of fronts. One of them is local participation in these collaborative councils.

AHRC: We have talked about how we got here and our successes. What about our failures? I'll put it another way. Where did we get a bum steer 20 years or so ago that caught up with us?

AVA: Seems to me that the people who gave the speeches and beat the drums back in 1980s for more advanced skill training and the need for collaboration had gotten hold of an important piece of future, as we know it to have unfolded. They were right about this.

But they were not really good at industrial history, nor did they see all of what was happening around them, nor did they understand the Dr. Jeckyl and Mr. Hyde personality of technology, and its influence on job creation.

There were two trends, and one of them has left us still perplexed in the vocational education community. From a historical standpoint, I would call it a deskilling trend, that has gone hand in hand with a growing need for highly trained people. Putting it simply, we have a very high proportion of jobs that take very little time to learn. I don't think that was sufficiently anticipated.

We created an impression that jobs were going to become more demanding, and use more of the human mind. If you get the training and education we said, you could have a *good* job. More and more heard us, believed us, and did what we prescribed. And at least a third of those that did so were disappointed. A lot of them bordered on being disaffected.

How can I best get my point across? Who cleans up this mess we are making? Well, you call them secretaries, but that is an anachronism. Our meeting is being recorded. The computer has heard us, knows all our deviations from standard English, and has been programmed to touch us up a bit before the transcript is ordered out of the printer. My split infinitives come out whole. When I say "Hell," the computer takes it out. But when it substitutes "Trash," it doesn't convey what I had in mind.

And how do you think these buildings get cleaned at night? When my father came to the area in the late 1950s, he said the only building on the horizon here in Rosslyn was an apartment complex called Arlington Towers. It's been torn down. Now the area looks a bit like lower Manhattan. When we leave for the subway or heliotube, an army of 2,000 people invades this place to do old-fashioned cleaning. Sure, they have less to do. There are computer-controlled automatic rug vacuums that sweep out from the walls. But the windows? The dusting? The plant watering?

Well, I won't belabor the obvious. But there are more low-skilled service jobs. And a great many highly paid workers just watch gauges or listen for a computer voice to tell them something has gone wrong and to call the engineer on duty.

These people suffer from a boredom syndrome. They go to their psychi-

atrists complaining they have dreams that the CAD/CAM system has been instructed that the humans around are not needed but are to be tolerated because of a labor-management-government bargain that says no factory shall be operated with less than five humans. The computers, in this nightmare, have been instructed to monitor the humans for any strange or counter-systems behavior.

I will stop there. Point is, we have too many low-skill jobs and we can't find the best face to put on the situation.

AHRC: I know your frustration. We are all working on it.

ASTD: One result of all this collaboration, from the standpoint of the membership agencies around the table, is that memberships have become overlapping. Industry and union people belong to the AVA. School-based educators belong to ASTD—now 25 percent of the membership. I would like to ask AHRC to explore holding all our annual conferences at the same place and in the same week.

AHRC: That's getting us back to the present and practical. Will you all still be able to get your separate registration fees? I was going to say that since 97 percent of our members have home terminals and video screens, do we need these conferences anyhow? Just flip the switch when a boring speaker comes on. Type the questions in during the workshop periods. Press a button when the conference is over, and the proceedings will be printed. So let's put this on next month's agenda.

AFL-CIO: That's a petty matter after all this important history. Where do we leave all this? What were you leading up to when you opened this discussion? Frankly, I am ready for the conference table top to unfold so we can get at those hot lunches waiting underneath that our dues pay for.

AHRC: A Yearbook on how collaboration developed, and what has been left undone.

AVA: After this discussion, I think you will find we all agree. Who are you going to get to put it together who knows enough about what happened so we don't have to pay a big bill for research?

AHRC: You should have the answer to that one. Let's ask Gene Bottoms. He was executive director of the AVA when that 1984 yearbook was put together.

Now, let's eat. If you filled out the slips last meeting, the meal should have exactly the cholesterol, sugar, caffeine, and lipid levels you asked for. We have installed the complete recombination and substitute system.

If you said none of any, don't complain about the taste (unless you had your taste buds altered. More do, I hear.) By the way, did you hear they just found too much clean fresh air is bad for you?

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Larry W. Johnson is chief executive officer of the Vocational Industrial Clubs of America, Inc. Beginning his career as coordinator of industrial cooperative training in Cary, North Carolina, he later served as assistant supervisor of trade and industrial education, with responsibilities for secondary technical education and health occupations. As chief executive officer of VICA, he has worked to bring American industry into full partnership in the vocational education process through establishment of the VICA United States Skill Olympics concept of technical committees. He has written numerous articles and developed publications dealing with the inclusion of student activities as an integral part of the curriculum. He received his bachelor of arts degree from the University of North Carolina at Chapel Hill and his master of education degree from North Carolina University at Raleigh.

William H. Kolberg has been president of the National Alliance of Business since January 1980. An expert in the employment and training field, he has held many positions in government, business, and education, including assistant secretary of labor and administrator of the Employment and Training Administration; assistant director, Office of Management and Budget, Executive Office of the President; director, Presidential Task Force on Urban Employment Problems; and special U.S. representative to the Organization for Economic Cooperation and Development. Prior to becoming president of the Alliance, he was vice president for public affairs at Union Camp Corporation. He is author of *Preparing Manpower Legis-*

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William Payne is assistant to the excutive director of the Tennessee Higher Education Commission, providing liaison with vocational/technical education. He was staff director of the Tennessee Comprehensive Education Study—a legislative-sponsored task force study that provides direction for educational reform at all levels, K-postgraduate. The study was responsible for major changes in governance of public education in Tennessee, including vocational/technical institutions. He served as North Area superintendent of the Memphis City Schools for nine years, during which period he was responsible for 40 schools, 30,000 students, five comprehensive vocational high schools, and two vocational/technical centers. He was responsible for developing a systemwide plan for career education and developed a systemwide plan for computer education for the Memphis City Schools.

Jack B. Reihl is secretary-treasurer of the Wisconsin State AFL-CIO. He represented labor on the National Advisory Council for Vocational Education from 1979 to 1982 and has served on the Wisconsin State Advisory Council on Vocational Education since 1970. He served on the State Advisory Council for Career Education, the State Advisory Council for Trade and Industrial Education, the State Apprenticeship Advisory Council for Industrial Crafts, and as a consultant to the State Apprenticeship Advisory Council. He recently finished serving on Wisconsin's Commission '85, which produced a statewide plan for economic development to identify new areas of cooperation and reaffirm existing linkages between business, industry, and the vocational training and adult education system in Wisconsin.

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